SUPPLEMENT.

The Mining Journal,

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FORMING A COMPLETE RECORD OF THE PROCEEDINGS OF ALL PUBLIC COMPANIES.

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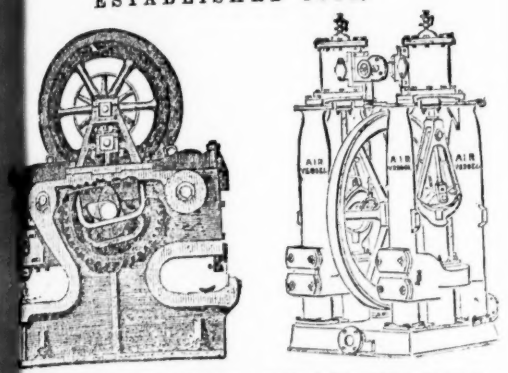

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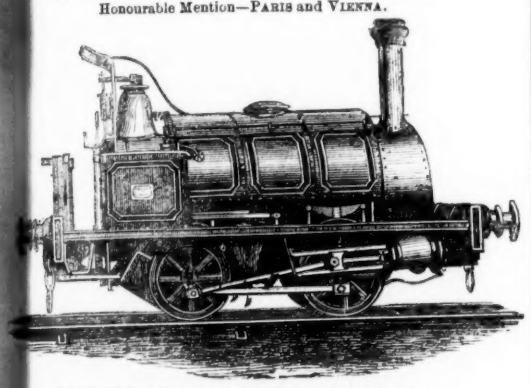

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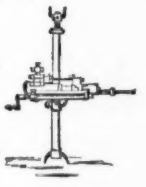

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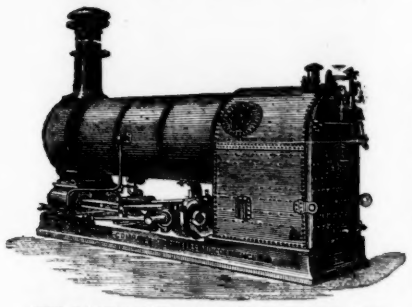

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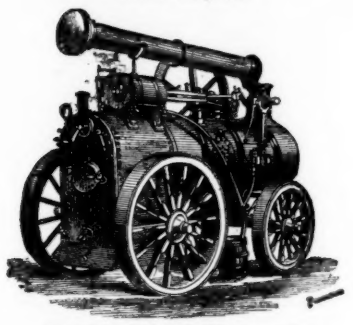

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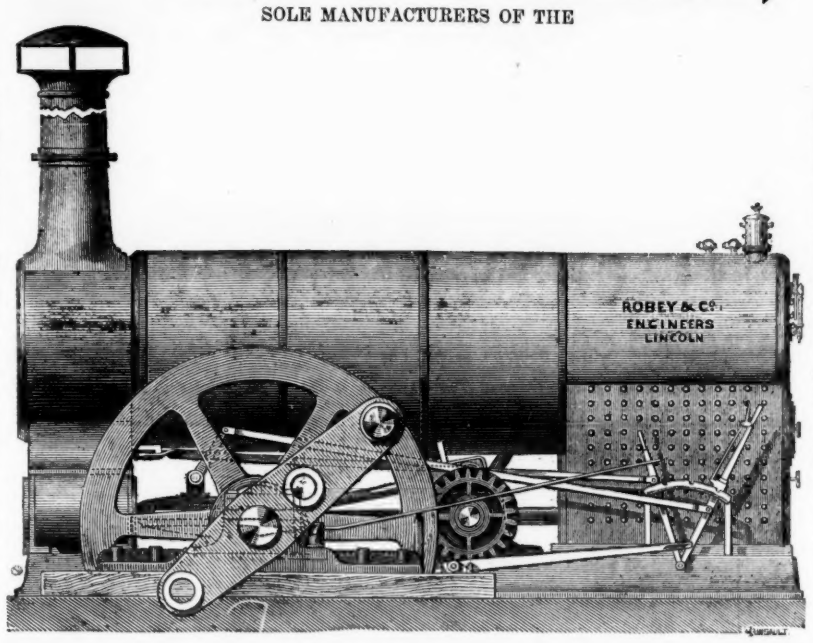

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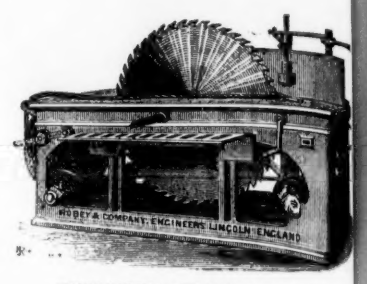

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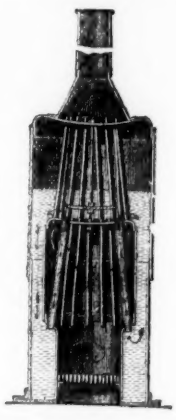

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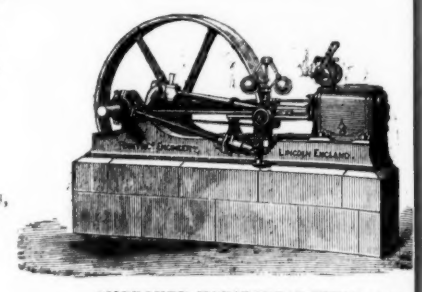

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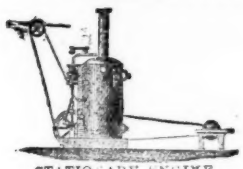

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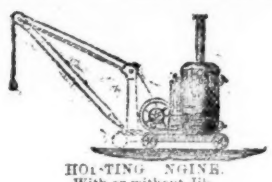

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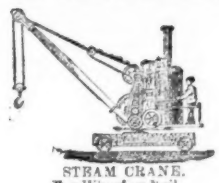

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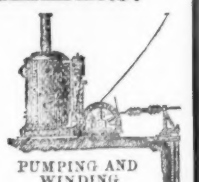

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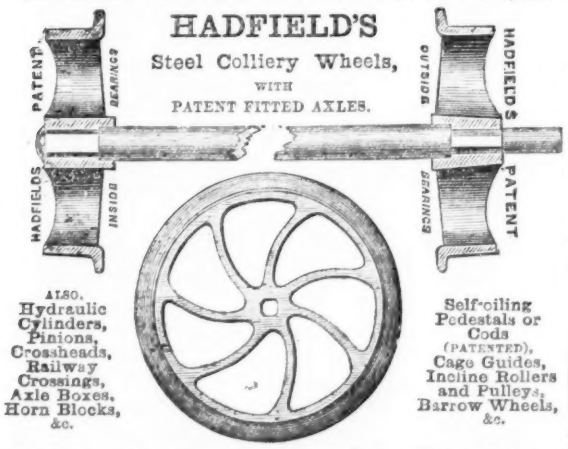

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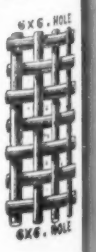

Original Correspondence.

ELECTRICITY FOR BLASTING AND SIGNALLING IN MINES.

At the Bristol Mining School, on Monday evening, an interesting lecture on this subject was delivered by Mr. W. BLANCH BRAIN, of St. Annals, Cinderford.

The Science of Electricity (he says) is becoming a subject of more importance daily both to the philsopher, the student, the commercial, and especially the mining portion of the world. I am persuaded that we have a very great deal more to learn with regard to its comprehension and its laws, and get a clearer insight into the nature of the substances from which the force can be most easily evolved, and be enabled to secure and store it up until our requirements demand the amount of work we are desirous of getting out of it. The first question, then, that occurs to us is—What is electricity? This has from time to time been attempted to be answered by various men holding different theories. It was not until the beginning of the 18th century (about 1730) that any material facts were discovered in this science, when Mr. Stephen Grey, a pensioner of the Charterhouse, discovered what he termed electrics and non-electrics, and also the use of insulating materials, such as silk, resin, glass, hair, &c., and it is obvious that until the latter fact was discovered the science would remain in abeyance, because there would be no mode of preserving the electrical excitement in the absence of non-conductors of this force. The close of the last century was remarkable for Volta's discoveries, and Dr. Franklin's identification of the electricity of the machine with the stupendous effects of the thunderstorm. Sir Humphry Davy, in the commencement of the present century, threw fresh light upon the already numerous electrical effects discovered. In 1821 Faraday commenced his studies in this branch of philosophy, which he afterwards so diligently followed up that he was for years, and I believe him to have been, the first electrician of his day. From the commencement of the present century discoveries have succeeded each other in regular order, and with the most amazing results, and now electricity is regularly employed in the arts, in the process of electrotype and electro-silvering and gilding, in the electric telegraph, and in a few years we may possibly see it employed as a source of artificial light. The nature of electricity, says Turner, like that of heat, is at present involved in obscurity. The story of the skinned frog agitated and convulsed by an accidental communication with two different metals, or, as some say, with the electricity from an ordinary machine, has been repeated in nearly every work on the science. Prof. Silliman, however, asserts that the galvanic story is doubtful, and is a fabrication of Alibert, an Italian writer of no repute, and that greater merit is due to Galvani than that of being merely the accidental discoverer of this kind of electricity, because he had been engaged for 11 years in electro-physiological experiments, using frogs' legs as electroscopes. It was whilst exerimenting upon animal irritability Galvani noticed the important fact that when the nerve of a dead frog recently killed was touched with a steel needle and the muscle with a silver one no convulsions of the limb were produced until the two different metals were brought in contact, and he explained the cause of these singular after-death contortions by supposing that the nerves and muscles of all animals were in opposite states of electricity, and that these nervous contractions were caused by the annihilation, for the time, of this condition by the interposition of a good conductor between them. The theory of Galvani had several opponents, one of whom, the celebrated Volta, succeeded in pointing out its fallacy. He maintained that the electrical excitement was due entirely to the metals, and that the muscular contractions were caused by the electricity thus developed passing along the nerves and muscles of the dead animal. To Volta we are indebted for the first voltaic battery, and the distinguished philospher may truly be said to have laid the foundation of this valuable branch of applied science.

It is now generally admitted that the electro-motive force, or forces, maintaining the current in the galvanic pair is the force of chemical affinity acting at the zinc plate. It is found, moreover, when we tax the galvanic current with electro-chemical or dynamical work, that the amount of work done by it is exactly proportionate to the quantity of zinc dissolved. These and similar considerations seem to argue strongly that galvanic action has its source in chemical action. Volta, however, and several of the most eminent authorities in the science maintain that the electro-motive force has its seat at the surface of contact of heterogeneous metals, and that chemical action is not the cause, but the manifestation of it. This view of the origin of galvanic electricity is called the contact theory, as distinguished from the chemical theory. Fleeming Jenkins, in his valuable text book on electricity, pages 22 and 44, adopts the Voltaic theory. The contact theory supposes that at the surfaces of contact of two heterogeneous substances an electro-motive force, invariable in direction and amount, is generated, and subject to modification only by the resistance offered by the conducting circuit. Faraday's experimental researches are in favour of the chemical theory. Faraday has also propounded a theory of electric action by induction, which, though it does not profess to overturn the other theories, in effect does so by leaving room for the assumption that electricity need be nothing more than a molecular affection or property of matter. In comprehensiveness it goes far to bind together the varied and complicated phenomena of electricity in all its conditions into a harmonious whole. Faraday finds a radical defect in the fluid theories—the leaving out of account the intervening medium in induction. In a lecture like this we can only just notice the theories of the various authors, but Grove, in his "Correlation of Forces," almost coincides with Faraday's ideas as just stated, and puts forward some ideas in his work well worth reading. The term electricity is applied, according to the dualistic theory of Dufay and Symmer, to two imponderable fluids, very similar in their properties, but diametrically opposed in their mutual relations, or, according to the theory of Franklin, to a single imponderable fluid, the relative excess or deficiency of which is supposed to produce the phenomena of positive and negative electricity. Professor Tyndall, in his "Lessons on Electricity," page 35, speaks rather in favour of Symmer's two-fluid theory, but adds this paragraph:—"Theoretic conceptions are incessantly checked and corrected by the advance of knowledge, and this theory of electric fluids is doubted by many eminent scientific men. It will, at all events, have to be translated into a form which shall connect it with heat and light before it can be accepted as complete. Nevertheless, keeping ourselves unpledged to the theory, we shall find it of exceeding service both in unravelling and in connecting together electrical phenomena." I cannot pass this professor without comparing his words given in his lecture on "Crystals and Molecular Force," delivered in Manchester on Oct. 28, 1874, with Faraday's words in his lecture on "Mental Education." Tyndall's words, page 81—"I have often asked myself whether there is no power, being, or thing in the universe whose knowledge of that of which I am so ignorant is greater than mine." Faraday's words, page 40—"High as man is placed above the creatures around him, there is a higher and far more exalted position within his view, and the ways are infinite in which he occupies his thoughts about the fears, or hopes, or expectations of a future life. I believe that the truth of that future cannot be brought to his knowledge by any exertion of his mental powers, however exalted they may be, that it is made known to him by other teaching than his own, and is received through simple belief of the testimony given. Let no one suppose for a moment that the self-education I am about to commend in respect of the things of this life extends to any considerations of the hope set before us, as if man by reasoning could find out God." Last of all is my own theory. Faraday, on Nov. 28, 1850, read a paper before the Royal Society "On the Possible Relation of Gravity to Electricity," and concludes at paragraph 2717 with these words—"Here end my trials for the present. The results are negative. They do not shake my strong feeling of the existence of a relation between gravity and electricity, though they give no proof that such a relation exists." Where Faraday left off I began, and the privilege of demonstrating that relationship has been given to me, and I am now preparing my apparatus for demonstrating the same, and as soon as I am prepared to stand the ordeal I shall apply to the Royal Society for permission to demonstrate this old but unknown truth, which unfolds a flood of light in the chemical as well as the electrical world.

APPLICATIONS OF ELECTRICITY FOR MINING PURPOSES.—The electric light apparatus has been so far perfected by Messrs. Siemens Brothers that I feel sure we can illuminate our colliery surface by night much cheaper by this means than by any other method. It can be seen working at Messrs. Siemens' Works, Charlton, daily, and in a short time one of the donkey-engines, which is now lying idle at night, will be the force employed to illuminate the pit banks at Trafalgar Colliery, instead of 3½ tons of coal.

MOTIVE-POWER.—I am now making some large batteries out of our old used-up iron tubs and tar casks, and the waste ammoniacal water from the gas-works, and some hematite iron ore, to drive a magneto-machine for pumping water out of the workings at a distance from bottom of shaft. I have a small electric-engine constructed on purpose. The battery on the table, the size of a quart pot, made in the same way, will heat ½ in. of platina wire hot. The residue of the battery is the purest of iron, perfectly free from carbon, and made direct from the iron ore without smelting, a method of preparing iron I am not going to lose sight of, and perhaps of some commercial importance in the future, especially if we can make our old tubs act as furnaces, and get a motive and illuminating power at the same time we are making pure iron.

ELECTRIC SIGNALLING.—The advantages of electric signals in mines:—

1.—For signalling long distances, and where the course or direction is not straight, and the method employed has to be conveyed round many turns or corners.

2.—Its instantaneous action under all circumstances, regardless of distance.

3.—Economy of labour and materials after first cost.

About ten or twelve years ago I introduced and arranged a system of telegraphic signalling at Trafalgar Colliery, which has continued to work, and is still working, very successfully. The advantages of electricity in merely economising time at these works are equal to 200 tons extra in the daily output over and above what they could raise with the old method of mechanical signalling; this is proved by the fact that our coal is conveyed at a distance of 1000 to 2500 yards from the workings to the bottom of the shaft, up a gradient of 7 in. per yard, worked by a pair of 17-inch cylinders, 3 ft. stroke, 22 cwts. of coal in each tub, yet we can sustain a supply of coal equal to 80 tubs per hour, and have put on the bank between the hours of 6 A.M. and 10 P.M. 1000 tons of coal (block), the winding-engine being only 18-in. cylinders, 4-ft. stroke, and the vertical depth of shaft 600 ft; and those which you see now are the very signals which were employed when the 1000 tons were raised. I took them out of the engine-house on purpose to exhibit here, and they have been in work nearly 10 years. For long engine-planes, whether horizontal or inclined, the best practical signal I know of is the ordinary chattering bell, especially where there are a great many stations; with this only one battery of a few cells (six or eight), smallest size "Leclanché," and good cables are amply sufficient for a distance of 2000 yards, notwithstanding there may be six or seven stations. For winding, or where there is only one station, I have here three very good systems. The first is the ordinary chattering bell, with a small indicating disc, which shows at the moment the bell rings either the words "stop" or "go on;" the words "go on" are printed on white, the word "stop" on red. The bell calls the "ear," the colour the "eye," and the words the "brains" of the engineman; and, having alluded to the subtle substance called "brains," allow me to digress for a moment from the subject to say that very little, if anything, on a colliery can be done without "brains."

I once asked a celebrated chemist how a certain chemical compound was prepared, and he concluded his instructions by saying—"It must be made with brains." Whether electricity be used either for signalling or for blasting, if conducted by a manager who is either a conceited fop, with clean gloves, or an ignorant, self-willed, impatient man, it becomes a costly, useless, and very often dangerous element; on the other hand, in the hands of a thoughtful, persevering, patient man, with ordinary common sense, it will add to his credit as an engineer, and save the firm he represents some thousands of pounds. The next instrument is the single-stroke bell. This is a very good instrument for very long distances, adapted with great resistance for length of cable. More costly and no better advantage for short distances than the chattering bell. It shows the words "stop" and "go on" the same as the others. The separate round brass disc is the same construction internally, but, perhaps, is a more convenient form for some circumstances, being detached from the bell. The last method of signalling I shall call your attention to is a new one recently introduced by Messrs. Siemens Brothers, of Westminster. The name of Dr. Siemens is very much respected by most of us in the iron trade.

These instruments were kindly lent me for this occasion, and have been submitted to me by their firm for my opinion as to their utility for mining. The method is good, the apparatus very complete, and even portable; its durability, comparatively speaking, everlasting. No battery required. The cable used must be moderately good, as the electricity employed is magnetic. The instruments speak for themselves, and although I have not had any experience in practice with them, I should not have the least hesitation in adopting this system if I had a place requiring this method. Distance makes little or no practical difference to this instrument, and it may be worked from any number of stations. At the Trafalgar Colliery we use a pair of Siemens' A B C speaking instruments between the manager's office on the surface and the office in the mines, and where the work done every minute is registered, and every minute lost accounted for. There is a great advantage in a speaking communication between the surface and underground. You can use the indicating bell as a speaking instrument, but the action is slow, yet quite fast enough for some men. I use the single needle code with the bell, and I have brought a single needle instrument to illustrate an easy method of learning it or the printing code. By means of the extra code being attached to the instrument for the purpose of receiving a despatch the learner can commence receiving a despatch slowly at once; the arrangement of the letter is such that whichever way the needle moves first the letter will be on that side towards which it moved, and as one movement to the left indicates E, two I, three S, four H, S must be formed by indicating E and I first; H cannot be made without making E, I, and S. The other letters are arranged on the same principle; they must either be E, or under E; I, or under I; S, or under S. The same on the other side. The next important point after selecting the most suitable instrument is to select a suitable cable. If it is to be used in an upcast shaft, or in any hot place, guttapercha covered cables are of no service, because they melt. For general use, such as engine planes, &c., underground, I have found the following specimens answer the purpose very well:—Nos. 1 and 1, covered with wire for protection; Nos. 2 and 2, ditto ditto; No. 3, ditto ditto; No. 4, ditto ditto; No. 5, ditto ditto; No. 6, but I do not find cables like No. 6 with guttapercha covered ones act well in dry places; in time the guttapercha becomes hard and cracks. For shafts it is better to fix a better cable than is actually required for the work, and protect it sufficiently strong to insure it against accident from pieces of coal or shale falling off the carts or tubs during the assent to the surface. No. 1, 1 C, and No. 2 covered 5 C; No. 6 will answer very well, or 1, 2, or 3, suspended through a 1-in. gas-tube are equally as good, if not better, and are easily withdrawn or replaced; No. 4, treated in this way, would make an excellent cable for winding shafts.

BATTERIES.—I know of no battery to equal the small Leclanché, I have had them in use both for blasting and signalling, and find they will go two years without replenishing. The two small batteries I have here are sufficient for any ordinary colliery signals; they consist of six small cells in each, price 3s. 3d. each cell, or 18s. 9d. per battery. For economy and durability they are not to be surpassed. Notwithstanding the efficiency of the batteries and instruments, cables, &c., it is quite possible for an accident to happen that a cable, battery, or instrument may require repairs, and it will be found very convenient to have a mechanical arrangement that can be used under such circumstances. The one I have found best I have used for several years; it is on the same principle as the electric, showing either the word stop or go on, or at each stroke of the bell, and colour red or white. Should the bell-wire break the word stop remains on until it is repaired. The late much respected Lionel Brough, Inspector of Mines, very much admired this arrangement.

ELECTRIC BLASTING.—The great advantages of employing electricity in blasting are—1. Safety and protection of life.—2. Economy of explosive.—3. Economy of capital and time.—4. Overcoming obstacles that nothing else will, and other advantages, such as "firing under water," sinking or driving in soft sandstone, and sundry operations not included in mining—granite splitting, rooting up old and new stubs, or roots, of trees, &c.

1.—Safety and protection of life are most clearly seen in its application for sinking purposes. The charges, whether few or many, notwithstanding there may be a very rapid influx of water, can be coolly mixed up, and the workmen ascend the shaft in peace and confidence, knowing that it is impossible for the shots to be fired until they reach the surface with the keys of the electric apparatus, which the leading sinker always carries with him. They know as soon as the carges are fired that none of them can possibly "hang fire," in the same manner as the various time fuses do, sometimes causing severe bodily injury or loss of life. This enables them to return at once to their work (especially if they have a proper explosive) without delay and loss of time, a matter of great importance in sinking.

2.—Economy of explosive: This must be evident when we know the explosive force of all nitroglycerine preparations exerts itself equally in all directions from the point of detonation. The combined force of any given number of charges in a mass of rock exploding simultaneously must meet with far less resistance than each one or two charges exploding singly or separately.

3.—Economy of capital and time: Loss of time must be loss of capital, especially where there is a large quantity of water to pump and a heavy staff of men to pay; for instance, the Port Skewet Tunnel under the Severn. If it is possible to drive 2 yards by employing electricity in the same time as one could be driven otherwise then the cost for pumping water and other standing expenses on these 2 yards is reduced 50 per cent.

4.—Overcoming obstacles that nothing else will: Those that have worked in a sinking shaft where it is almost next to impossible to see the bottom of the shaft from one week's end to another in consequence of the water, and have nothing better than the time fuse, such as Bickford's, which is generally preferred, can truly appreciate the advantages of electric blasting, when it makes no difference whether it is 6 in. or 1 yard of water over the bottom. Mr. George Keeling, of Lydney, succeeded in deepening the Lydney Harbour 4 ft. without stopping the shipping traffic, and conducted his boring and blasting operations 14 in. below the water level; he used one of Siemens dynamo-magneto machines, and very high tension fuses with wires insulated a little extra.

At the Nerquis Colliery, near Mold, they were sinking through some sandstone, and having a large quantity of water tried dynamite, but the dynamite, to use the language of the foreman, "lifted about as much stuff as would fill his hat, and made a hole about as large." They applied to me, and I recommended simultaneous blasting with small charges of dynamite. This method they carried on successfully for several months, and accomplished the work they required. One of my men, Mr. B. Matthews, carried out a similar undertaking in sandstone in a large sewer between Salford and Manchester. The Peterhead Granite Company are now using it extensively for splitting large blocks of granite for monumental and building purposes. And the proprietor of Hawkwell Colliery, Forest of Dean, Mr. Jacob Cliwers, told me a few days ago that he never should have been able to achieve the great success he had accomplished in his extensive and costly undertaking without the aid of electricity and dynamite.

SELECTING APPARATUS.—Before adopting electricity for blasting the first thing is to make sure of a good fuse. This I found a great difficulty in the year 1872. I first procured Abel's, but they were not fitted for miners' hands, and although the fuses were good in themselves they were not adopted to meet the practical difficulties in mining. After making many hundred different compositions, and registering carefully several—I may safely say thousands of—experiments, to mention nothing about the expenditure of capital and time, I succeeded in making about 40 or 50 reliable compositions. A portion of each has been kept for testing from time to time, and Capt. Harvey has taken some to Jamaica to see how it would stand a hot climate, and the oldest I have is as good now as when just made. In order to test your fuses put the number you wish to test into a tub of water, and fire them with an electric machine, which generates but a small quantity of electricity. This is the most severe test you can submit the fuses to. I will now explode some under water. Here we have 24 ordinary dynamite fuses in a tub of water, and a machine that will not give more than a spark sufficient to jump 1-32nd part of an inch. I will now explode 50 with the same machine. I have here a machine I can explode 1000 with, but I will explode 100, which will be amply sufficient to demonstrate the certainty of the fuse. The next question of importance is the electric machine or exploder. We have here the following frictional or statical machines:—Abegg's; Bornhardt's—both German machines; the American Smith's; and Electric Blasting Apparatus Company American Improved. Abegg's condenser is connected whilst generating with the cables, and as soon as electricity is generated to overcome the resistance of the fuses they explode. This is decidedly objectionable for several reasons. The next is Bornhardt's; a good machine, but large, liable to damp, and the external place of condenser at the same potential as the earth. (Fleeming Jenkins, page 25.) The American machine is 13 inches by 13 inches, and 5 inches thick. It weighs about 14 lbs, is not liable to be affected by damp, and will give a spark 2 inches long, and when charged one set of plates in the condenser are at a higher, the other at a lower, potential than the earth. Thus a great advantage, especially if good cables are employed, and this is the only machine that has this advantage. [The internal construction of this machine was then shown.]

We have now the magneto-electric machine—a very portable machine for two or three shots, not any good for mining. And Siemens' dynamo-electric machine, of which we cannot speak too highly with regard to durability and damp-proof, but requires good insulation; the quantity of electricity generated is so small that you cannot afford to loss any of it. Cables for blasting purposes must be well insulated, especially when there is salt water. The spark may be very strong at the electric machine, but it is required at the charges to be exploded, and if the cables are defective only a small portion of electricity will arrive there, and the higher the tension the less will go. No. 2 is a good cable insulated with best india-rubber, and No. 1 is the best. It is especially made for me, and designed to meet the difficulties met with in past experience. No. 3 strongly protected cable, to be used near the face of headings, and cannot be injured by the shots. Nos. 4, 5, 6, 7, and 8 for fuses and connecting wires.

Among the diagrams exhibited were two showing the position in which Mr. Brain puts in the bore-holes in a face of hard limestone rock for blasting. The heading shown was 6 ft. 8 in. high and 6 ft. wide, whilst the forward progress made by each blast is 3 ft.; therefore, 6 ft. 8 in. × 6 ft. × 3 ft. = 120 cubic feet of rock is brought down by each blast. The aggregate length of the hole he put in to remove this is but 107 ft. 11 in. there being five holes of 2 ft. deep, four of 3 ft., eight of 3 ft. 1 in., nine of 3 ft. 3 in., four of 3 ft. 9 in., and four of 4 ft. 3 in., or 34 holes in all, of the average length of 3 ft. 2 in. each. This admirable result was produced by Mr. Brain's own system of radial boring, the great advantage of which appears to be that the whole of the face can be bored from one stretcher bar at one fixing. This plan he worked very successfully at the Drybrook Iron Mine. The fact that by Mr. Brain's system nearly 1⅛ cubic foot of rock can be brought down by each 1 foot of blast hole bored will suffice to commend it to miners generally, and the students of the Bristol Mining School may be congratulated upon having learned the method of doing it; which consists in placing the stretcher bar carrying the rock-drill at 5 ft. from the floor, and putting in seven rows of holes—5 of 4 and 2 of 5—radially with the stretcher bar for nearly the centre, and of varying length as mentioned. There are four holes horizontal, and near the floor, which are put in independently.

Experiments were then carried out, consisting of 50 high-tension

fuses connected up in circuit, and fired simultaneously; then 24 miners' fuses with 3-ft. wires (insulated with gutta-percha), which were submerged in a large vessel of water, mixed up in circuit, and exploded simultaneously, then 100 on the platform in the same way. In each case the remains on the wires were handed round to the audience, and there was not a single misfire in either case, and although there was some little anxiety and manifestation of alarm on the part of some of the company, there was not the least accident or mishap. The lecturer, in conclusion, to further prove the certainty of his fuses offered to unite up and explode 1000 of them simultaneously if the company could spare the time and wait, but they all appeared satisfied with the results, and needed no further evidence of their excellence. All present were highly gratified and interested in what they had seen and heard, and which was evidenced by the frequent stoppages in the lecture through the hearty applause which was given.

COLLIERY MANAGEMENT, AND DIVIDENDS.

SIR,—To all appearance collieries are so managed at present that no dividends are likely to be ever paid. From two instances, one may judge of the rest:—

1. NEW SHARLSTON.—For the last two years the output has been very considerable. For the year ending Dec. 31, 1875, the gross profit was 20,253*l.* 13s. 1d., reduced to a net profit (by sundry charges) of 9399*l.* 15s. The output was 157,190 tons. For the year ending Dec. 31, 1876, the output was 176,530 tons. Here the gross profit was only 13,114*l.* 14s. 3d., which has been reduced to 7518*l.* 17s. 10d. Now, every year we are met by the same disagreeable retention of the profits—"this profit is absorbed for depreciation."

2. DUFFRYN MAIN COLLIERY.—Here the shareholders were induced to amalgamate with two other very large concerns—Dynevor and Neath Abbey, the directors promising us an increase of 40 per cent. by the union. The preliminary liquidation has been going on for more than two years, and is not yet completed. The excuse of the delay is said to be an action for a few hundred pounds which a customer in Belfast owes the company: 2006 hands are here reported to be employed, and from the united collieries 1500 tons are said to be daily raised; and yet not one word hinted either about the completion of the liquidation, or, what is more important, about a dividend. A DISAPPOINTED SHAREHOLDER.

Feb. 20.

THE LATE MINE ACT, AND COLLIERY MANAGERS, &c.

SIR,—It will not be denied that the gentlemen who are members of the Legislature, and all others who were concerned in the framing and passing of this excellent Act, deserve great praise, not only for the labour they gave so freely, but for the sincerity of their intentions. There is no doubt that they expected they had succeeded in framing a Bill as nearly as possible perfect, so far as human performances can be perfect. Yet it must be confessed that the Bill has to a great extent proved to be a failure; the fact is that the Bill has not been carried out literally—at any rate, not according to the intentions of the framers. I believe that O'Connell once said that it was an easy matter to drive a coach and six through any Act of Parliament, and it must be admitted that wagons and all kinds of colliery vehicles have been driven through the Mines Act. I allude particularly to that part of the Act which refers to "certificated colliery managers." It was generally expected that the clause in the Act which provided that "every mine must be under the control and daily supervision of a certificated manager" meant what is put plainly on the face of it, that each mine should be really conducted by a responsible certificated manager, something like the mode of working ships, when the captain must of necessity have the sole charge of the vessel. This view, however, has not been carried out; this particular clause, indeed, has only been recognised to a partial extent. Previous to the passing of the Act a viewer managed any number of mines he could get hold of, and they have continued to do so; the only change that has been introduced has been the pretty general distribution of certificates to overmen and underviewers, &c. It would be absurd to suppose that these men are certificated managers in the sense intended by the Act. No doubt it will be asked why the Inspectors have not seen to the enforcement of the Act; but it is well known that most of them have grumbled loud and deep respecting the course events have taken, but it will be recollected they have only a limited amount of power.

In section 26, clause 13, this occurs—"The owner or agent may nominate either himself or any other person as manager, but the manager must not be a contractor," &c. This clause takes the strength and power out of all that had so far been well done, as the owner or agent may nominate himself to conduct and manage operations he never saw, nor ever will see—never, in fact, intends to see. The whole thing becomes extremely absurd.

There is no doubt that this excellent Act, which has done much good, is ripe for revision—it ought, there is little doubt, to be amended, and made more stringent in some points, and I have briefly noticed one of its most defective points. MINER.

SPONTANEOUS COMBUSTION AND EXPLOSION ON BOARD OF COAL-CARRYING SHIPS—PATENT FUEL.

SIR,—Another calamity has befallen a Liverpool ship—the Ada Tredale has been burnt at sea through both fire and explosion, and that within four months of her leaving a Scotch port. She sailed from Ardrossan on July 20, 1876, and by Oct. 13 she was fiercely burning in Mid-Pacific, 1200 miles from nearest land. Whether the coal comes from Wales, the North of England, or Scotland, there is no difference; they all are liable to the same dangers. The steamer Prussia, belonging to the Allan line, had some time since an explosion on board before her bunkers were actually filled, and the coal on board was undoubtedly North Country coal. It is impossible to conclude from these calamities that much of the most powerful heat-producing and steam generating coals, as well as the inferior qualities exported to South America, contain the elements of spontaneous combustion or explosion in an eminent degree.

It may be pointed out (arguing from the course adopted by the Government through the Customs on the suggestion of the Royal Commission on the subject) that it is time for the coalowners to look about them, and be prepared with a remedy for the dangerous properties of their coal, should the Register of Customs, in the event of the loss of a ship by fire, place their coal on the dangerous list as having been carried by the ill-fated ship. No doubt the effect of such information would be damaging to the character of the coal, even if it were not in reality the cause of the calamity. I have on various occasions when employed by the Crown on enquiries into the loss by fire of ships analysed the coal from the colliery which supplied the vessel, whether as cargo or for ship's use, and I have universally arrived at the conclusion you then published (*vide* the *Mining Journal*, 1873-74, "Coal a Dangerous Cargo") that the calamity arose from the liberation of carburetted hydrogen by the breakage and trituration of the coal in cases of explosions, and from chemical changes taking place in the coal when spontaneous combustion took place, and I also came to the universal conclusion that except as regards explosions no ventilation was of any use.

Now, I cannot recall a single instance in which such an explosion or combustion has occurred on board any ships freighted with Patent Fuel. It will readily be admitted that when the causes of danger are eliminated previous to shipping there is no longer any fear of conflagrations. I do not mean, however, to represent patent fuel as a universal panacea against explosions and spontaneous combustion. When fuel is made with pitch, for example, there may be another source of danger. If the pitch is not well distilled, and a portion of the oleaginous constituents are retained, the fuel, if stowed where the temperature is somewhat elevated, is apt to ignite spontaneously from the evolution and oxidation of these matters. Moreover, another great drawback to certain patent fuels is that they are liable to soften in the bunkers of steamers or in the holds when the vessel is passing under hot climates. These defects of certain patent fuels, however, can easily be got over by perfecting their manufacture, or by adopting different systems of agglomeration. Unfortunately for the coalowners who may be seeking in patent fuel a remedy for the defects of their coal, they cannot help looking upon patent fuel generally very suspiciously. So many worthless processes have been patented, so many have been tried and failed, and so many more have been the basis of bubble companies, that I quite understand the perplexity of the coalowner seriously thinking of turning his defective coal into a first-class fuel. Indeed, for the very same reason do the coal consumers look upon patent fuel with distrust. Very often the patent fuel which they had determined to try has been found by them so much contaminated with anything but combustible materials that there is no wonder they should look coldly on the article. However, time rolls on, and perfection arrives, and then slowly but surely the prejudice dies out. Having had for many years past a great deal to do with patent fuel, I propose, with your permission, to sketch out for your readers the history and progress of patent manufacture—and I shall feel very happy if my humble help can assist any of them in the choice of a system of turning coal into a really pure and valuable article. A. VASSARD.

Old Vicarage House, Greenwich, Feb. 22.

MINING EXPLOSIVES, AND THEIR COST.

SIR,—A "Reader" and a "Practical Man" suggest as a remedy for the cost of explosives a compact organisation, having for its object the consideration and discussion of all questions affecting mines and their working. No doubt such an organisation would be productive of much good, and I should be very glad to lend any small assistance in my power in furtherance of this matter. It has often seemed to me that there is a good opening for an Explosive Carrying Company, organised on a sufficiently large scale to admit of its entering into arrangements with large railways and canal companies to farm the entire carriage of explosives over their lines under proper conditions for security and rapid delivery. I believe such a company would receive the support of the principal railways and of the large manufacturers, and it would unquestionably be a boon to the consumers. —— L. A. A.

ORGANISATION OF THE MINING INTEREST.

SIR,—Your correspondents, "Reader" and "Another Reader," would do good service to the mining interest if they could succeed in forming a society to watch over the interests of the mining community so far as the same may be affected by written and unwritten Acts of Parliament, but I fear their principal difficulty will arise from the lukewarmness of those they would befriend. The tendency of the governing body in this age seems to be towards legislative interference, and unfortunately practical effect is given to this interference by the passing of the long, unintelligible, and often contradictory Acts of Parliament, such, for instance, as the Explosives Act of 1875, which, whatever it may be to the military mind of its author, is puzzling enough to the commercial man, and has been spoken of by Mr. Arnold, one of the London magistrates, as "a Bill which he should think very few lawyers would understand."

Very few accidents really do occur in the transport of explosives, and they are, in fact, much safer to convey than many other commodities which enjoy a better reputation, and if their carriage did require some regulating, it surely did not need the voluminous, unintelligible, and prohibitory set of rules which are strung together under the title of Explosive Substances Act, 38 Vict., ch. 17, and which has had for its result the annoyance of every person affected by it, except, perhaps, those drawing salaries as officials, and what is even worse than annoyance, the increased cost of some of the substances affected by it. Now, Sir, I do not hesitate to say that if a compact organisation to watch over the mining interests, and to consult the mine owners, had been in existence, such an Act would have been impossible. I apprehend that another object of such an organization would be to give advice and assistance to those who are affected by these unintelligible Acts, and if this be so I shall be very pleased to become a subscriber to such a society to the extent of two or three guineas per annum. A. Z.

RICHMOND MINING COMPANY—AN ENIGMA.

SIR,—A person, a relative of whose had purchased some Richmond shares, called upon me a few days since, knowing that I took interest in the welfare of the Richmond Mine, to ask if I could solve the following enigma:—A circular bearing the signature of the secretary was issued some time since, a copy of which appeared in the Journal, on the subject of the suit pending with the Eureka Company, from which it appeared that our managers were, like Louis Napoleon's Minister, M. Olivier, entering into the war with a very light heart; indeed, they appeared to treat the matter as a short but pleasant diversion, from which it was scarcely possible that any ill could accrue to the Richmond Company. The relative above alluded to, however, becoming alarmed at the great reduction in the value of the shares, called at the office with the hope of getting some satisfactory explanation. He was met by the secretary with a very gloomy countenance, who told him he thought the shares would go still lower, as the suit with the Eureka Company would be a most costly affair. As I do not pretend to see further into a milepost than any other person, nor assume the office of a diviner, I told him I really could not say which was the real Dromio—the secretary in the circular, or the secretary in the office. Such things are surely not calculated to increase the confidence of shareholders—already at a low ebb—in the management. But as you have lately kindly given me a considerable space in your columns I will not trespass further on this occasion than again to suggest an unofficial meeting of shareholders, or that an influential committee be formed for the purpose of obtaining an improvement in the management of the undertaking. —— COMMON SENSE.

THE EMMA MINE.

SIR,—As a shareholder in this unfortunate concern I object to raising, as is proposed, 5000*l.* on debentures at 5*s.* in 1*l.* I am not to be intimidated at the threat of Mr. Stoughton, the solicitor at New York, that he will withdraw from the case unless he receives 3000*l.* thereof. Two American gentlemen present at the meeting on Monday stated that an American lawyer once in Court cannot withdraw from a case. The English habit of "refreshers" to counsel is unknown in the United States; but it would seem that Mr. Fowkes, the English barrister sent there by Mr. M'Dougall, has put false notions in Mr. Stoughton's head. That gentleman first received the large fee of 1000*l.*, and Mr. M'Dougall accedes to his demand for 3000*l.* more. One of the American gentlemen present denied the accuracy of Mr. M'Dougall's assertion that Mr. Stoughton "was at the very head of the American Bar," and offered the subjoined preamble and resolution, which, owing to some technicality, was not adopted. A SHAREHOLDER.

Whereas, in ignorance of the decision of the House of Lords to the effect that claims against promoters of public companies can only be made by the original allottees of the shares therein, the shareholders of this company, as a company, in November, 1875, passed a resolution empowering Mr. M'Dougall at his own expense to begin suits against the promoters thereof. Therefore, be it resolved—That said resolution, being in contempt of the decision of the highest court of the realm, and also in contempt of the Companies Act, which under any circumstances places the affairs of companies solely in the hands of directors, who cannot delegate power, be and the same is hereby repealed. Resolved—That this meeting expresses their dissatisfaction at the tardiness with which the counsel employed gave their opinion on a question of so much importance. That said counsel taking a year to answer it, instead of five minutes, has been the cause not only of unnecessary delay, but of great loss and expense to this company.

VIRNEBERG COPPER MINING COMPANY.

SIR,—Allow me to make an enquiry through the Journal respecting this company. In the prospectus in last weeks Journal it is affirmed that the mine was successfully worked by a French company, and only given up on the breaking out of war. But in Bradshaw's Continental Guide, under the head "Rheinbreitbach," I find it stated that the copper mines in the valley behind the village, of which Virneberg is named as one, had been abandoned on account of the largest having been inundated by water from the River Rhine. If the mine be open to such a casualty it is a serious drawback; and, perhaps, the secretary of the company, or one of the directors, will kindly enlighten the public on this point through your columns, and state whether such an event has ever occurred, and whether in case of its recurrence the appliances at the mine are sufficient to overcome such a difficulty. Many of your readers, doubtless, are inclined to become shareholders; but, like myself, would wish to be— —— ON THE SAFE SIDE.

CARDIGANSHIRE MINES A.D. 1877—No. IV.

SIR,—Proceeding southward we next have the BWLCH STELLIN MINE, where since my "History of the Cardiganshire Mines" down to 1874 but little has been done. I may say that, according to my judgment, all the trials have been made at the wrong end, the level having been extended eastward from the engine-shaft instead of westward, where the lode presents a very fine appearances, with good stones of lead ore, and I think 1000*l.* more expended in driving in this direction will probably lead to a rich discovery of ore, as I am persuaded that a vein of such masterly appearance, and with such a gossan are sure indications of there being large courses of ore near at hand. CWMDWR MAWR is the next mine I shall offer a few remarks on. Since 1874 a good discovery has been made at surface by a local party, who have not the means of putting up the necessary machinery for manipulating and cleansing the ore. This could be done for about 2000*l.*, and when completed it could not fail to make good returns and profits. We come next to the NANT-MOCH MINE, which contains one of the finest lodes in Cardiganshire, being from 40 to 60 ft. wide, composed principally of a very fine gossan, quartz, sulphur, and blende at surface. The engine-shaft has been sunk 30 fms. under the adit, where the gossan has almost disappeared. The lode, so far as it has yet been cut through to the west of the engine-shaft, contains fine lead, stones of copper, blende, and quartz, and when the south wall of the lode shall have been reached I fully anticipate the laying open of a rich course of lead ore. If the necessary capital be forthcoming to give this property a fair trial there is no doubt on my mind that the greatest body of ore yet found in this county will be found in this part.

We will now proceed with PLYNLIMMON MINE, which for years past has made returns capable of giving good profits had it been provided with proper machinery, for the want of which it has been brought to the very verge of ruin, and it is now a toss up whether it shall live or die.

In the ELGAR MINE there has been a change of management, and during the past 12 months a good water-wheel has been erected, with drawing and pumping machinery. There are two lodes that unite or form a junction to the east of engine-shaft, one being the Mwyn Gorddu and the other the Peny Cefn north lode. From the masterly appearance of these, where seen in the adit, I believe a productive and profitable mine will be laid open in depth.

I will next take the MONYDD GORDDU MINE, where some good machinery has been erected, and some returns made from it. The very fine appearance of the vein at surface created in the minds of some people a feeling that underneath it was to be found another rich "Potosi," but I was never very sanguine on this point, having seen similar backs of lodes not far from this spot, which proved of little value below. However, the company seem to be opening out pretty fair paying ground, and if we may take the reports to be correctly valued there should be nothing to hinder this property entering the list of dividend mines this year.

I shall conclude my present remarks with COURT GRANGE, which may be very appropriately described in the following words—"Machinery erected. Underground work neglected."

Goginan, Feb. 20. —— ABSALOM FRANCIS.

DARTMOOR—MINERAL DEPOSITS, AND RAILWAY—No. II.

SIR,—From Lee Moor Works to the Meavy Clayworks, and on to Walkhampton Common, by Prince Town, Dartmoor, and alongside of the proposed line of railway to the latter place, you will find extensive tracts or beds of clay cropping out to surface on the hillsides and in the valleys as well, though they are here and there covered with a shallow deposit of peat bog—in almost all cases like those of Lee Moor and Cholwich Town, in 1828. In the Prince Town district some shallow workings on clay have of late been in operation, with every indication of early success. There is an extensive breadth of clay ground in this locality, with abundance of water on the moor for the necessary clay washings and working. Dartmoor proper extends over an area of 54,000 acres, and with its common land is, probably, not less than 90,000 acres in extent, rich in minerals, peat, and granite, with extensive plains of grazing land for miles in extent, which open a splendid field for investment to the capitalist and speculator. To form an opinion of Dartmoor and its resources one should devote some little time for a few weeks to the object, and take up his residence at the Duchy Hotel, Prince Town, where you will receive every attention and comfort—one can make a careful and thorough examination of the Moor and its mens. You will not fail to observe the white decomposed granite with mica, the general sure indication of clay cropping up on your route for several miles on your way. And if you extend your walk right away you will observe the white decomposed granite with mica, the general indication of clay, in your route. For several miles on and towards Amicombe Hills, in the direction of Ackment Valley, you will not fail to observe here and there the same clay outcrop; and in the flanks or plains of the Moor, beyond Fowy Head, some rare samples of clay were dug from the bog near 20 years since. You will find the same indications to within a short distance of the Okehampton Railway Station. The firs and hill sides in this district of the Moor produce granite of the very best description, and will polish up to facings like marble.

Turning south from Prince Town you have an immense tract of mineral ground before you, far away in the distance for miles. There are the usual indications of clay beneath the peat bogs at Pit Cot, near Prince Town, and you are within a short distance of the old White Works Tin Mines and Tin Streams, the tin ores from this locality being, with one or two exceptions, the best and purest in England. White Works, as a mine, is scarcely more than 30 fms. deep; it has been scratched, as it were, in every conceivable form on a great number of lodes at surface, but little in shape of actual mining has yet been systematically carried on on the property. The rock formation is granite, with its various cross-courses and counter lodes. This property may be regarded as being of great value with the aid of a railway, so as to bring a supply of good and cheap material. There is a full supply of water generally for all purposes. The deep bogs below the mine in the valley have for ages past produced rich stream tin of the purest quality, whilst the hill-sides and vast plains for miles in extent produce pasture for thousands of head of cattle grazed thereon in the summer and a portion of the winter. We may extend our journey from this place to South Brent, a distance of from 10 to 12 miles, and we have the same rock formation, with here and there an outcrop of clay, as before noted. And although you will notice that all the valleys have been worked over in the early ages for tin and tin streaming, with large mine excavations on the surface, the clay and granite in those ages appear to have been but very little sought after. Granite quarries have of late years been opened on various sections of the moor, some of them very profitably for many years, but, for the want of a railway around those masses of granite tors, all are at present unable to compete with our friends in the more favoured districts of Devon and Cornwall. Dartmoor is abundantly rich in minerals and pasture. We are unable to compete in price and the delivery of our goods with those of more favoured localities. We have abundance of those minerals in Dartmoor, and water machinery can be cheaply applied to the working and shaping of granite into a variety of desired forms and designs, and much of the heavy, costly, and slow manual labour can be dispensed with. It ought not to require a Brunel, Wheeler, or Wilson to work out and set in motion any amount of machinery to work granite into all its required forms and uses. In this way these mountains of granite and thousands of acres of rich china-clay can be wrought into a profitable return, conferring an immense benefit to mankind in general, as well as to the income of H.R.H. the Prince of Wales.

We have here an immense field of wealth, extending over 80,000 to 90,000 acres, lying quietly in our midst, but few people know or care for them, and we move about over those vast clay and tin deposits (from which we have just now been extricated out of a bog, frowning on nature and its riches. We little notice or care (What is a bog?) so long as we have kept clear of it, and, like Mr. P. O.

Tehby, we have no idea that those hidden millions worth of gold under our feet should be tapped, developed, and brought to market for the benefit of mankind and this great commercial country. We keep, as it were, on those vast riches, but yet send millions of our hard-earned capital to develope other countries. We may attribute this, then, to two or three causes. The first, probably, is that few people know Dartmoor, its capabilities, and resources; secondly, to the local prejudices and interests of those who have no desire to know the merits of Dartmoor, or see it brought into cultivation, or the mineral resources developed; and, thirdly, the want of a railway, the pioneer of civilisation and progress. At last, I notice those extensive plains and estates of the Duchy are slowly being developed and coming into cultivation. They are, as before stated, the property of H.R.H. the Prince of Wales, and are of immense value; but, strange to say, we do not regard them as such, and we move about on the plains and hill sides, taking little notice of the vast herds of cattle grazing thereon in the summer season. We may remark those fine wonderful cattle—from whence do they come? Carrington writes—"We are to be taken as a family of Nimrods, ramrods, and fishingrods," and really it would appear the great poet was not far wrong. Let us make a stand here, then, and consider this great property, making but little addition. YOUR CORRESPONDENT.

CORNISH MINING.

SIR,—Notwithstanding the present depressed state of the metal market, there are some mines in the county being worked in a very quiet manner, paying the investor well for his outlay in them, while the anticipated rise in the price of metals would cause such a reaction in all such concerns as to double their dividends, and consequently enhance their market value *pro ratio*. I have no desire publically to name such mines, suffice it to say an enquiry into the merits of most of the mines that have "weathered the storm" will satisfy the most sceptical, whereas there are some that have yielded to the pressure, whose merits, on a further small outlay, will open up mines of value equal to any yet discovered in this the richest mining county in England. On reference to an advertisement in this day's Journal it will be seen that one of such properties can be acquired by the public, the incoming terms being such as to render it easily accessible, and I have no hesitation in saying that before the present year expires those who avail themselves of the opportunity will reap a rich reward, particularly when it is known that the same lodes east, and adjoining it, held good as deep as 300 fms. from surface, and gave over 1,000,000*l.* in dividends. The property sought to be worked (without any premium) produced 60,000*l.* worth of tin only 40 fms. deep; having now reached the transition state of the ground from the tin to copper, another 20 fms. more sinking will show as good results as the same lodes have done further east—the discovery of a great and profitable productive deposit of copper. *St. Day, Cornwall, Feb.* 22. CHARLES BAWDEN.

THE MINING INTERESTS OF CORNWALL.

SIR,—"The cycles and epochs" which occur from time to time in commerce, manufacture, and trade are also reflected in agriculture and the products of the soil and surface of the globe. These, likewise, occur in minerals and metals, together with the other products of mining in the depths of the earth. There are "epochs and cycles" no less marked and characteristic of civilisation and the social progress of mankind; societies and communities advance and retrograde in proportion to the industry, integrity, and intellect of the masses; while states, and even nations, rise and fall in accord with the greed, interests, and ambitions of revolutionists and monarchs. Republicanism and Cæsarism are conflicting elements, and the history of the last two decades affords us striking incidents for reflection in the career of America, Italy, France, Germany, and now of Turkey and of Russia, yet it is the two latter powers that we shall now especially refer to. As regards Russia, we have positively advanced that country no less than 135,964,508*l.*, which stands at this moment indebted to us by that restless and aggressive nation, yet in the face of this indebtedness and an empty exchequer there are no less than 600,000 men under arms, about one moiety on the frontier ready to attack Turkey, while the latter country has no less than 800,000 men ready for action. This latter country has borrowed from us all the money it could, and is at this moment a defaulter as regards the payment of interest, with an indebtedness to us of over 185,000,000*l.* In the face of this indebtedness nothing has come to England from our ceaseless support of the Ottoman race from its enemies both inside and without its ill-gotten territories, coupled with the disintegrating forces that are inevitable in such a seething mass of corruption. With money and with political influence we have long enough assisted the Porte in its lawless and wanton career of vice and oppression. They now find themselves bankrupt in everything but brute force. All that there is now left for us to do is to watch the course of events, and see that Russia and the other Powers do not compromise our interests and influence in the East. Russia must either advance her troops and forces at an early date or retreat at once, or she will inevitably become bankrupt as well as Turkey. They admit that commerce and industry are at a standstill, that credit is shaken from one end of the country to the other, the list of bankrupt and ruined merchants augmented every day, and the spring tillage neglected in consequence of the absence of able-bodied men in the South. It is not unnatural under these circumstances that the Russian people, though faithful to their sovereign, are murmuring, and demanding explanations of the motives for which they are called upon to make such heavy sacrifices. It is to be hoped that under any and all circumstances neither of these contesting rivals will receive further money or material assistance from this country.

It is fortunate for mankind that the Creator of the universe has ordained that there shall be "epochs and cycles" of depression and inflation in mining pursuits, as in every other branch and department of the industrial enterprises of the masses. Coal and iron were discovered centuries ago, yet every day discloses fresh beds of the former and boundless deposits of the latter. Still trade and industry languish from the cronic inanition of commercial confidence, consequent on the political disquietude in respect to the East. Copper, tin, and lead are also being found in great abundance, while the mines producing the ores never looked more permanent in character or prolific in yield, both as regards the present and the future. It has been decreed that the "vaults and chambers" which contain the hidden wealth of the earth shall never be discovered at any one time or in any one age, nor by any one individual, but remain in perpetuity to meet the wants and requirements of mankind so long as the world exists. As "cycle after cycle" occur, or "decade after decade" pass into oblivion, history reminds us that such characters and men of energy, perseverance, and mining skill existed as the Williams's, Taylor's, Harvey, Lemon, Fox, Treffry, Clymo, Halse, Daubuz, Vivian, West, Hitchins, Teague, Tredinnick, Bennetts, Gundry, Lyle, Davey, Francis, and many others of equal repute and success. Without such persevering and undaunted characters we should have had no such mines as Wheal Friendship and the Devon Great Consols, the Caradons, Trelawnys, Crinnis, Par Consols, Fowey Consols, East Rose, Phœnix Consols, United; 50 others in Gwennap—Busy, Jewell, Damsel, Gorland, Tresavean, Penstruthal, Bassets, Bullers, Croftys, Roskears, Dolcoath, Cook's Kitchen, Tincroft, Carn Brea, Harmony, Tolgus, Neptune, Botallack, Levant, or St. Ives Consols, with 100 other profitable mines that have become exhausted, though their workings were attended with millions of gains.

It appears to us that one of these "cycles" of discovery is about to refresh mining enterprise in the south-west peninsula of Cornwall, and especially so in the St. Austell district. In the face of depressed prices for tin over the whole of last year the Eliza Consols gave two dividends of 3000*l.* each, and has already this year declared a third of 4000*l.*, while the prospects are represented to be of the most encouraging character as regard the future. Again, at Wheal Fowey and East Eliza Mine, situate in the lands of Sir Coleman Rashleigh and Mr. Kendall, to the east of Eliza Consols, and immediately west of Fowey, no less than eight productive tin and copper lodes have been opened upon on the backs and found to be highly mineralised for copper and tin—a considerable quantity of both minerals being now at surface. The company consists of 50 shares, of 100*l.* each. This company is likely to prove an early important and signal success. To the east of this mine stands Fowey Consols, which declared dividends of 212,080*l.* on 19,760*l.* capital; to the south Lanescot, which gave 250,000*l.* dividends; south-west stands Par Consols, which divided profits of 236,070*l.*, on 7200*l.* capital. Crinnis, Pembroke, and other great and profitable mines surround. Let us, therefore, hope that the "cycle" of mining prosperity now upon the tapis may be marked by the revival of the mining interests of this important district. R. TREDINNICK,

81, *Bishopsgate-street Within, Feb.* 21. Consulting Mining Engineer.

LOW-PRICED MINING SHARES, AND HINTS TO INVESTORS.

SIR,—Having in last week's Journal given my ideas about Cornish mining shares, I will now endeavour to give further reasons why I think there is a grand field open in Cornwall at the present time for the investment of capital. I am informed that our tin markets are not likely to be again so plentifully supplied from Australia as hitherto. That some of the mines are paying dividends and self-supporting, or nearly so, the shares of which are offered in the market at prices that must bring fortunes to the buyers.

Investors naturally like to obtain as high a rate of interest as possible, but at the same time they object to having anything to do with what are called speculative securities. Now, the merits of any particular security must depend on a variety of circumstances, and these circumstances it should be the investor's business to examine, and by means of them to determine whether the investment is safe or risky. An intending investor should, in the first place, make himself acqnainted with the nature of the property he is about to embark in, for unless this is known it is clear that he cannot estimate the amount of risk involved. Then the two or three latest reports should be carefully perused, and the executive looked well into. Having mastered these points, the investor can then form his own opinion as to the probable future. Unless an investor makes himself acquainted with these details before placing money in a stock he embarks in, as it were, blindfold, and it becomes simply a matter of speculation whether it will turn out well or the reverse. But if he makes himself master of all the facts connected with an investment he will be able to judge not only whether there is any risk in it, but also as to the nature and amount of the risk. He can then decide whether it is or is not a suitable investment for him. Investors who select their securities in this way not unfrequently discover investments which have been long neglected, and which are, consequently, quoted at low prices. Sooner or later such shares are sure to become better known and appreciated, and then a great advance in the price follows. That the Western mines have been under a cloud for some time nobody can deny, but with the prospect of better prices, and an increased demand for tin, there can scarcely be a doubt that many of the mining shares now neglected will have such a rise in the market that will be sure to surprise those who are not acquainted with this description of property. I thank you for your kindness at all times, and regret I cannot advocate the cause better.—*Crown Chambers, Threadneedle-street.* JOHN R. PIKE.

TWO NEGLECTED SECURITIES.

SIR,—Mr. J. R. Pike—in his able *resumé* of mines in last week's Journal, open for a rise and deserving a lock-up—has omitted mention of two whose merits should attract the attention both of speculators and investors—to the former they promise, I think, a source of nearly immediate profit, and to the latter a steady and increasing dividend. The mines I refer to are the Almada and Tirito, and the San Pedro, and they are not of speculative origin—the former, whose shares are 1*l.* fully-paid, and may now be purchased at from 8*s.* to 9*s.*, was opened about five or six years back, during which time it has returned to its original investors nearly a third of its capital in dividends, has not been very productive the last few months owing to a sudden poorness of ground; this has now been worked through, and it is confidently expected that shortly will be tapped the rich ley of ores long known to be existing on this property; should this result be attained the shares must go to their old price—15*s.* to 20*s.*—and with this view speculators who seldom err have been quietly purchasing all a limited market could offer. The San Pedro Copper Mine was for some time worked at an enormous profit; in fact, the profit in one year reached within 5000*l.* of its total share capital, when the shaft fell in from near the surface to the bottom, and the mine was for the time completely lost, the owner finding the only way to recover the mine was by sinking an entirely new shaft commenced doing so, the ore having steadily improved in quality the lower the workings went. The new shaft was sunk, but very slowly. At this crisis the owner died, and the property passed into the hands of the Court of Chancery, when the present company formed and purchased it, sending out from this side powerful pumping machinery; this is now hard at work. As yet at each succeeding level the lode has proved both richer and larger, and should the next cross-cut at a still lower level show the same result a very considerable improvement may be expected in the position of the property, as an immense body of ore will then have been proved.

Bold capitalists will doubtless during this year have a fine field for their daring in such foreign securities as Turks, Egypts, and Russians, which for the next few months will fluctuate much, and the Central American markets will also be kept pretty lively. Those who desire excitement, and who are prepared to risk heavy losses for the sake of contingent and uncertain gains, will search long before they find a field more suited to their tastes than the above. Others not so venturesome may find in the securities I have mentioned, together with other "selected" mines, a sphere well worthy of their attention. Again, referring to the Almada, the increased and still increasing yield must add greatly to their value, proving the shares in this company to be rather a steadily improving investment than of the speculative character usually assigned to mining shares.—*Twickenham, Feb.* 19. E. S. F.

SCIENCE IN ITS APPLICATION TO MINING.

SIR,—Who can wonder at the propriety of "Justitia's" conclusion to seek repose in retirement after exhausting himself in a paroxysim of impatient rage as he has done and exhibited in the Supplement to last week's Journal. In my reply to a former letter of his I characterised his remarks as idiotic, but his effusion in the Supplement to last week's Journal appears to me to indicate insanity. He indulges in a strain of raving as incoherent as it is senseless and inconsistent. His vociferation from a position of careful concealment that "a tree is known by its fruit" is a sufficient evidence, if any were needed, of the dimness of his perception, and the unconsciousness of his own ignorance. If he considers himself a fruit-bearing tree in the sense of successful mining, why does he conceal that tree and its fruit? I need not to inform you, Sir, that I and my acts and conduct in mining have been before the British public for upwards of a quarter of a century, and the success which has attended my efforts is known to scores and hundreds of people who are yet alive; and I have in hand, and shall shortly introduce to the public, another proof of my fruit-bearing mining in the much maligned Llanrwst Lead Mine in despite of the malevolent *ipse dixit* of a host of small creatures presumably resembling "Justitia." The precept "A tree is known by its fruit," selected by him to stimulate his genius and courage, is rather an unfortunate one for a person who takes up a position behind a rampart for the purpose of firing off his little "pop-gun" at a veteran in the field clothed in armour and invested with all the paraphernalia of modern warfare. It certainly makes a little noise—a report in miniature; but there is neither smoke, fire, or effect, save a little dust which begrimed this would-be artillerist. I challenge him to a comparison of his life's acts, and doings in mining with my own, determinable by the preponderating success of either, and afterwards to an unimpassioned discussion of the subject denoted by the headline of this letter. If I were a thing of yesterday, as he appears to be, it might seem presumptious in me to attempt the enunciation of any views and opinions I entertain of this or that branch of mining, but fortunately the generality of your readers prefer the experimental facts of practical men to the schemes, pretensions, and verbiage of theoretical nondescripts. It is too general assumed that practical men are destitute of scientific knowledge, but that is a fallacy which I will endeavour to explode if "Justitia" will undertake to controvert my views with anything like decent common sense and knowledge, after having first proved his claim to be regarded as a tree bearing fruit to mining. It is conceit of having "hemmed me in" when as yet I have not entered on the discussion, is clearly "characteristic" and very amusing. It looks more like the verdure of a sapling than the fruit of a tree. R. KNAPP.

Llanrwst Lead Mine, Feb. 19.

OUTLINES OF GEOLOGY.

SIR,—In the interesting paper on the above subject in the Supplement to last week's Journal, communicated by "M. B. G.," there is a statement to the effect that anthracite or graphite is found in the Silurian formation in the Isle of Man. It is the first time I have heard of its existence here except as a commercial commodity, and I certainly have not met with either in any of my geological expeditions, though they embrace most of the island. Perhaps the author will kindly indicate the locality where it occurs. J. B.

Rushen, Isle of Man, Feb. 20.

BARNARD'S PROMOTERS' COMPANY (LIMITED).

SIR,—Observing the abridged prospectus of this company in your columns I have written Mr. Barnard for the prospectus in full, and find it, although rather lengthy, still sufficiently interesting to claim a careful perusal; in point of fact it is a document that should be read by one and all, mining men as well as investors, to cheer up their flagging spirits in these depressed times. Mr. Barnard must have kept his last new scheme for promoting the welfare of mining a profound secret, since we Tavistockians, who generally know his movements, were hardly aware of his migration from our mining district to the City of London. It is something in this world of discovery to bear the good wishes of the community at large, and these, I know, follow Mr. Barnard to the great town, and although certainly beyond human power to command success, still no mining man, by honesty of purpose, ever aimed to deserve it more than our old friend and resident for his perseverance against almost insurmountable difficulties, and his well-known chemical experiments upon the subject, with cherished hopes and arguments which have so constantly appeared in the Journal, relating to the treatment of ores and improvements in furnaces, &c., has long been the universal theme. I observe that, exactly typical of the man, he has given the new company his name, showing his anticipation of success and not failure. May he have it, and this time I believe he will, for if Mr. Barnard cannot make mining pay, at least the promoters, it is folly for others to attempt to do so. A RESIDENT OF TAVISTOCK.

Feb. 21.

PEDN-AN-DREA MINES, AND MR. GRANVILLE SHARP.

SIR,—Under the head of East Wheal Lovell, Mr. Granville Sharp in last week's Journal writes—"West Wheal Jane, Spearne, and Falmouth, and very recently Pedn-an-drea Mines, the shareholders of which have, I consider—in which I am not alone in that conviction—been cruelly deceived, if not robbed." Now, this is language which Mr. Granville Sharp is not justified in using as regards anyone connected with Pedn-an-drea. I know nothing of the others. I can tell Mr. Granville Sharp that the manager of Pedn-an-drea made it his business to go all the way to London for the express purpose of meeting the shareholders, and of advising them against selling the mines. More I can tell him, that after they had determined to sell the mines the said manager repeatedly advised them to await a more favourable opportunity, as any small favourable turn in affairs would ensure a far better price being realised. More yet I can tell Mr. Granville Sharp, that before the sale the said manager told the deputation sent down from London expressly to represent the company that he intended bidding at the sale with a view to becoming the purchaser, and of working the mines. Will Mr. Granville Sharp point out wherein is any shadow of deceit and robbery here? The agents cannot be charged with under-rating the mines, because their printed reports all prove to the contrary; while present results go to prove that neither did they over-rate the mines. Who then deceived the shareholders? If they have been deceived it has come by fault-finding outsiders, who always had, in their obtrusive ignorance, something to say prejudicial to the mines or to the management, and as the constant "dripping of water weareth away rocks," the shareholders, already sufficiently discouraged by the continued depression in the price of tin, at length allowed themselves to be acted on by those outside fault-finders who knew nothing about it. Mr. Granville Sharp seems to have been misled in a similar manner; but then no man is justified in giving public expression to hastily formed conclusions by any such plea, and he is, therefore, responsible for his unjust and reckless remarks. Unless Mr. Granville Sharp is more discreet and has a better case in East Wheal Lovell, he will win no fresh laurels from the able men he will find there to meet him, although they may concede to him the advantage of accepting the proferred loan of his own office for the contest.

Before the public auction was held for the sale of Pedn-an-drea the fiat had gone forth from the shareholders themselves, who were all powerful therein, that the mines should be sold; and if not sold as a going concern should be broken up, and the materials sold piecemeal. This was publicly declared to be irrevocable before a large number of the public, every one of whom had an equal opportunity of purchasing, and can bear witness to the open and public manner in which the auction was conducted. Does Mr. Granville Sharp believe that under these circumstances the manager of the mines had not an equal right to become the purchaser as other people had? Had he not done so the mines, in all probabity, would ere now have been shut up, and the machinery have gone to swell that huge accumulation we see about, which nobody appears to require, and fast deteriorating into old iron. He had no more to do with the conducting that sale than Mr. Granville Sharp had. No doubt he had more faith in the vitality of the mines than anybody else had; but almost everybody seemed to have so given over Cornish tin mines to perdition at that time that it was as useless to try to inspire others with a similar faith as it is for Mr. Granville Sharp to try to prove his unfounded assertions, or to justify his unprincipled attack. It appears that, although mining men seemed generally to have given over tin mining as hopeless, the surprising vitality shown by some of these mines has astounded them, and they are now chagrined at having let many opportunities slip. But they may now retrieve their position in that respect, for if they only look at the tin market fairly they must see that a rebound is sure to result, and a return to higher prices than any yet reached set in; and there are plenty of good things still going begging.

The writer was the manager of Pedn-an-drea Mines for the old company, and a large shareholder therein; and although he could not rule the price of tin in their favour, and could not, consequently, inspire the shareholders with sufficient hope to continue the working, believes he enjoys their confidence and esteem still, which Mr. Granville Sharp can find out on enquiry. He has held situations of trust before the world for considerably more than a quarter of a century, and during the whole of that time has enjoyed high reputation for probity and honour. Can Mr. Granville Sharp show a fairer escutcheon? Now, I am not given much to blowing my own trumpet, but when compelled to do so in self-defence am under no necessity of giving it an uncertain sound. By my single enterprise I have had the good fortune to preserve these mines from ruin, affording remunerative employment to 450 people, and sustenance to their families, who otherwise could not have found employment, and if this has resulted in some profit to myself I call that profit well earned. Other men who, by imposing combinations and much talk, happen to have achieved similar results, have been awarded handsome testimonials and fulsome flattery. We may both, perhaps, apply to ourselves the old lesson, which may have been applied before, "Let he who putteth on his armour boast not himself as he who putteth it off," inasmuch as until we shall have turned up our toes to the daisies, the best of us may meet with his master. Yet, if Mr. Granville Sharp is not more happy in his inspirations with

regard to East Wheal Lovell than he has been in jumping to conclusions with regard to Pedn-an-drea, he may have to make that or some similar lesson his especial study.

Having done all that could possibly have been done to keep the late company together; having, on their determining to break up, done all I could to get a favourable time for selling, although that was not probably thought of sufficient importance; having plainly stated beforehand that I intending becoming the purchaser; having purchased in public auction, and kept no secret of the matter; having worked the mines six months, and to everybody's satisfaction; I am now told that the shareholders have been deceived and robbed.

Why did not Mr. Granville Sharp have something to say respecting this before, if he thinks it is incumbent on him to set the whole world right? I believe that he has never been a shareholder, and that, therefore, he cannot know much of what he is writing. Had we been making a loss here would Mr. Granville Sharp have been so zealous now, or so reckless in his remarks; or would either he or those he referred to as having been with him in his "conviction" have come forward to have met part of that loss? Although Mr. Granville Sharp may feel envious at others but himself doing anything more in the mining world, they will yet continue to do, after men shall have ceased flattering him, and after his name shall have been forgotten.—*Redruth, Feb.* 21. W. TREGAY.

NEW STONE AND ORE BREAKER.

SIR,—I hear that a Birmingham manufacturer is about to bring into the market a stone-breaker, which is considered so far superior to anything of the kind at present in use that it is certain to command attention; it has been in operation for some months on a small scale to verify its capability and efficiency, and the conclusion arrived at is that, although it costs more than the stone-breakers now used, it will do from 80 to 90 per cent. more work with very little increase of driving power, as the working parts are only one-third as numerous as those in the most approved machines now in the market. I consider it beyond question that this is the perfection of simplicity, and I shall be glad if you will take an early opportunity of publishing full details of the invention, as I am sure that as soon as it is known it will take a foremost rank among stone-breaking machinery.—*Feb.* 21. OMEGA.

Meetings of Public Companies.

ARUBA ISLAND GOLD MINING COMPANY.

The fourth ordinary general meeting of shareholders was held at the offices of the company, Gresham House, on Thursday, Feb. 22,

Mr. J. V. SMEDLEY in the chair.

The SECRETARY read the notice calling the meeting, and also two letters received that morning from Mr. Archibald and Mr. Macfarland, concerning an offer made by the latter on behalf of himself and certain responsible parties in New York, who are in the business, to purchase all the "dump ores" now at the mines, estimated at some 15,000 to 20,000 tons, at the rate of 8s. per ton. He (the secretary) also read the report of the directors, which, after stating the changes made in the direction of the company consequent on the death of Mr. George B. Sargent, and the terms for conversion of debentures offered to debenture holders of the company, which have not proved generally acceptable, proceeded as follows:—

There are, however, several share and debenture holders and others who are largely interested in the success of the company, and who, being impressed with the value of the company's property, are willing to contribute funds for the purpose of resuming operations on the island upon the basis of a lease from the present company to a newly-created company upon terms which shall primarily secure the repayment of the new capital required, and the extinguishment of the debenture debt, and payment of the other liabilities of this company.

The concession held by this company is practically unsaleable, as it cannot be transferred without the consent of the Government of Curaçoa, with whom the company is unfortunately at present engaged in litigation. In the event of the non-payment of the annual rent to the Government of Curaçoa, not only does the concession lapse, but all the machinery, plant, &c., on the island become forfeited to the Government.

In view of this situation the directors have given their earnest consideration to the proposal for the formation of a new and independent company to lease the mineral rights, machinery, and plant of the company for a term of years. They regard this as the only alternative left of preserving the property.

By this means the directors hope to get their debenture-holders well secured, and to obtain the funds requisite to pay the annual rent secured by the concession, and the debts and current expenses of the company, and to have those additions made to the machinery on the island which are necessary for resuming operations upon a safe and profitable scale.

The directors have much pleasure in reporting that on the 15th instant Mr. John Taylor (of the firm of John Taylor and Sons) attended a board meeting, and informed the board that his firm was prepared, on terms to be arranged, to undertake the management of the new company, provided such magagement at the island and the selection of the required machinery are left to them, they, of course, acting under the constant supervision of a board of directors in the usual way.

The directors beg to report that Mr. George B. MacFarland, formerly the company's engineer at Aruba, and who is acting in co-operation with responsible parties at New York, has recently offered to purchase all the company's tailings now at Aruba, amounting to some 800 tons or thereabouts, at the rate of 10s. per ton. The directors have accepted this offer upon condition that payment for the same is made in cash upon or before delivery.

PHOSPHATE OF LIME.—The lawsuit regarding the company's right to the mineral phosphates of lime upon the island was decided by the local court at Curaçao on May 14, 1875, adversely, as was anticipated, to the company. The whole question, however, has gone by way of appeal to the Supreme Court of the Netherlands at The Hague, and the company's counsel there is sanguine that the company's rights to the phosphates will be established. According to latest advices, the cause is expected to be heard on April 13 next.

With regard to the expenses incidental to the phosphate dispute, the directors recommend that the shareholders should by resolution to be passed at this meeting authorise them in their discretion to make mutual arrangements with the proposed new company.

The auditor—Mr. James Ford—retires, and offers himself for re-election for the current year.

The CHAIRMAN said that the directors in the report had endeavoured to make everything as clear as possible, but before moving the adoption of the report perhaps it would be as well for him, in a few words to condense the proposal contained therein, and show clearly the relative position of the debenture-holders and shareholders in the event of the proposal being carried out. With regard to the debenture holders they would receive shares in the new leasing company equal to the amount of their debentures and interest; they would be placed, in fact, in the same position as the cash subscribers to the new company, and would receive with them three-fourths of the profits until they were repaid the full amount of the shares, together with 10 per cent. interest. In the case of the shareholders, whose shares to-day were practically worthless (for the company was very nearly out of funds, and in debt 2500*l.*, or nearly so), they would receive one-fourth of the profits of the new leasing company until the shareholders in the new company have been repaid the amount of their shares and interest, from which time the two companies would divide all the profits between them, each taking half. The shareholders will have seen in the report that Messrs. John Taylor and Sons have proposed to the board to take the mining management of the new company. (Hear, hear.) The directors consider this a very important fact. One of the sons of Mr. John Taylor originally went out and made a report upon the mines and prospects generally of the company at the time of the purchase, and it is a matter of great satisfaction to find that this gentleman is now ready to back the report which he made *then* with additional money, which he is ready to put into the shares of the new company; therefore, practically they would have the advantage of all that Mr. Taylor knew, and he (the Chairman) wished to draw particular attention to that fact, as the directors consider it a clear indication of the turning point of the venture having been reached. He would further call the shareholders' attention to the offer received that morning from responsible persons in New York, to purchase "dump ores," as affording additional proof of the value of the mines when properly worked. He did not see that he need make any further observations, but should be happy to answer any questions.

Mr. SUTTON: I suppose you have not decided on the terms on which Mr. Taylor will enter upon his arrangement with the company, whether by a fixed remuneration or whether upon a remuneration dependent upon results?

The CHAIRMAN said it would practically depend upon results. The matter had not been fully gone into, but to show them what was running in the mind of Mr. John Taylor, he might mention that the expression of that gentleman was "No cure no pay." But Mr. Taylor had made one stipulation, and that was that the company should remove from its present offices in Gresham House into his office in Queen-street-place, so that Mr. Taylor might have a more paternal eye over the concern. But practically, although the terms had not been settled, he (the Chairman) might say they would not be onerous.

The CHAIRMAN then formally moved the adoption of the report and accounts, which was seconded by Mr. DAWSON.

The CHAIRMAN, in answer to a question, said that the A and B shares of the present company rank alike. Practically, the nominal capital of the present company instead of being 500,000*l.* would eventually be only 50,000*l.*

The resolution was then put, and carried.

Dr. BRODIE SEWELL proposed the following resolution:—"That the directors be and they are hereby authorised to grant a lease of the company's mines, metals, minerals, machinery, plant, and property upon the terms stated in the report, and also if they deem it expedient to compromise the dispute as to phosphates upon such terms as they in their discretion may consider most conducive to the interests of the company."

Mr. THOS. K. WEIR (of Messrs. Henry Bath and Sons) seconded the resolution, which was put, and carried.

Mr. WIDDICOMBE proposed "That the directors be, and they are hereby, authorised in their discretion to make mutual arrangements with the proposed new company with respect to the expenses incidental to the phosphate dispute."

Mr. SUTTON seconded the resolution, which was put and carried.

On the motion of Mr. DAWSON, seconded by Mr. J. WIDDICOMBE, the auditor, Mr. James Ford, was re-elected, with the same remuneration as before.

The CHAIRMAN, in reply to a question, said that the auditor had taken his fees in the securities of the company, and had also subscribed beyond that.

The CHAIRMAN said he regretted that Mr. Samuel Norris, the Chairman of the company, was unable to take the chair, owing to his continued absence abroad, but he might mention that a letter had been received from that gentleman, fully approving of the steps which had been taken by the directors.—The letter was read.

On the motion of Mr. PARROTT, seconded by Mr. SUTTON, a vote of thanks was passed to the Chairman for his conduct in the chair, and the meeting broke up.

ENGLISH AND AUSTRALIAN COPPER COMPANY.

The ordinary general meeting of shareholders was held at the City Terminus Hotel, Cannon-street, on Thursday,

Mr. R. A. ROUTH in the chair.

Mr. ROGERS (the secretary) read the notice convening the meeting, and the report and accounts were taken as read.

The CHAIRMAN said the business of the meeting was to present to the shareholders the twenty-sixth annual report and statement of accounts, to declare a dividend of 1*s.* per share, and to re-elect, if it should be considered proper, the retiring directors—the Right Hon. G. C. Bentinck, M.P., and Mr. J. Russell Frewer—and also to appoint an auditor on behalf of the shareholders. Before putting the motion for the adoption of the report he would make a few observations on the report and the working of the period under review. During the year the amount of ore dealt with had been 13,751 tons, as against 12,249 tons in the previous year. The quantity of ore smelted at the Port Adelaide Works was 7924 tons, as against 7452 tons; and at Newcastle Works 6478 tons, as compared with 5244 tons in the preceding year. The quantity of copper made at the Port Adelaide Works had been no less than 2043 tons, against 1938 tons in the previous year; and at the Newcastle Smelting-Works 893 tons, against 730 tons in the previous year. It would be found on reference to the report that the amount of work done during the year under review was considerably more than in any previous year, but on that point, upon which shareholders are usually most susceptible, and on which the directors felt the greatest interest, the amount of profit, that was much less than they would all like to have seen. It was natural that that should be accounted for in some form or another, and so far as they could judge he would point out to the shareholders a few of the disturbing elements which had arisen during the past year. It would be well known to all the shareholders what an extreme position of political uncertainty there had existed for some time past. This had reacted on the markets in this country, and the directors had had a very anxious and troublesome duty to perform—more anxious and more troublesome than in any previous year since he had had the honour of being chairman of the company. They had had to watch the markets from day to day very carefully. At the last meeting he had had to refer to the fluctuating condition of the markets, but it was fairly and legitimately hoped that larger profits would have been made, and he had hoped to have had to place before the shareholders on that occasion, notwithstanding the disturbed state of the markets and the general agitation in political affairs, a better statement of accounts than those now presented. They had had to deal with another remarkable thing during the year—the system of selling copper had been quite changed. Their markets had been to a considerable degree forestalled by large public sales by auction. These sales had, in the first instance, caused a very heavy depression in the market; but, as they were continuing, the directors had found after very careful consideration that it would be wise to adopt the same principle which had been adopted by some of the large copper merchants in London—the Wallaroo Company, for instance—and have sales by public auction. These sales had from time to time caused drops in the price of copper to the extent of 5*l.*, and sometimes 7*l.* per ton; at the same time, they had produced a reaction throughout the whole of the copper trade. After mature deliberation the directors concluded that if they stood out, and refused to sell by auction, the company would suffer, because their market would be changed, and, indeed, taken from under their feet; and then they would not get the prices which they ought to do. This was an element which had very much disturbed them during the period of which he was speaking. Beyond that there had been the copper that had come from abroad.—6500 tons having come into Europe from Lake Superior. That was a far larger amount than had ever been received from there before. These causes together had had the effect of making a difference in the price of the copper sold during the year under review, as compared with the previous year, of 14*l.* per ton, which he need not tell the shareholders represented a sum of close upon 30,000*l.*, which, if they had sold at the previous year's market prices, would have been in their pockets, instead of in those of the consumers. With regard to the supplies of ore, the supplies had increased from 12,249 tons in 1874-5 to 13,751 tons in 1875-6, and their manager had reported that, on the whole, he was glad to find the quantity of ore was being well kept up from one source and another. During the last six months they had received from New Caledonia 1600 tons, being more than had been raised there during the whole of the previous year. Therefore, so far as the supplies of ore were concerned, they might fairly congratulate themselves that they were in a very good position. With regard to the smelting operations, there was no doubt that they were gradually increasing in the quantity of ore smelted. They had hoped that the amount of their profits would have increased with the amount of ore smelted. That would have been the case if they had had a fair and somewhat reasonable market. He did not despair that they might do considerably better, but at the same time there were still great elements of disturbance in the market which they must watch with the greatest care. The stagnation was not limited to the metal markets, but it was felt in all industries. He hoped that this state of suspense would be put an end to, and that they would know what was to be done. It would have been seen from the Returns of the Board of Trade that the exports had been very much less than they had been for many years past, and that trade was at a standstill. Everyone was watching from day to day the position of the market, and the directors would do all in their power to benefit the company. He thought that with a slight improvement in business the price of copper would return to its normal state. Since the accounts were made up a heavy fall in the price of copper had taken place—from 84*l.* to 77*l.* 10*s.* They had seen the price even lower than that before, but with a sudden rally in business the price had improved, and he hoped that would be the case again, but they were unable to control the copper market. They could only watch it, and take every possible means to make good rules as they could. They had a much heavier stock of copper on hand than last year, and the reason of this was that when the public sales took place they stopped the market. There was now a freer sale going on again, and their instructions to their [illegible] brokers were to feed the market, and not to break it down; and the directors would use their best endeavours to get the highest price for the copper. During the year they had the benefit of low prices in purchasing some of the ore, so that they stood in a strong position in regard to this matter, and they had to congratulate themselves that what might have been a heavy loss had been avoided, and that they had been able to scrape together for the shareholders a little dividend. The Chairman concluded by moving the adoption of the report and accounts.——Mr. COBBETT seconded the motion.

After a short conversation on the condition of the metal market, the motion was carried unanimously.

The retiring directors—the Right Hon. G. C. Bentinck, M.P., and Mr. J. Russell Frewer—and the shareholders' auditor, Mr. J. Viney, were re-elected, and the meeting closed with a vote of thanks to the Chairman.

EMMA SILVER MINING COMPANY.

An extraordinary general meeting of shareholders was held on Monday at the City Terminus Hotel, "for the purpose of considering the position of the action now being tried in New York, and taking such steps relating thereto as may be deemed advisable." Mr. A. W. MACDOUGALL (the Chairman) presided, and in opening the proceedings said he wished them to understand their position to-day was that of a crisis—it was a question with them of the Emma Company of now or never. For the last two years the company had existed, not as a mining company, but as a "lawing" company. The only property which they possessed or had possessed for two years was a lawsuit; they were dead as a mining company two years ago, when Park seized the mine. Why he was allowed to do so by the Gardiner Board had never yet been made very intelligible to him, but hoped some day or another, if they bridged over the present crisis, to learn whom and why that claim was allowed to go to judgment, by which Park won the mine. Their position, as he had said, was a case of "now or never." In regard to the "now," they might lose the suit which was going on in New York, but that depended on the jury. The question before the meeting was, Did the shareholders wish to go on with this suit or throw it up and have done with the company? They required as directors 5000*l.* to carry on the case to a conclusion. When this money was subscribed they had this chance, and this only—that if a jury found for them, they would get a verdict and recover their money. The company was started in 1871, and by the Statute of Limitations all possible remedy ceased during the present year. If nothing were done now, nothing could be done hereafter. They had been conducting this trial in America since Dec. 13, and the Court had sat every day. They had been, however, suing on an action the form of which was a difficult one, and one which the present Board would never have framed in such a form. The action was based on the prospectus, which was issued on Nov. 9, and the consequence was that any frauds subsequent to that date were shut out from the evidence. He wished the action taken in a frame in which they could include the "whole lot;" but till they got the American suit out of the way nothing could be done. If they allowed the action to be thrown away in New York for want of funds to carry it on, they would never be able to carry on any other action, because judgment would go by default, and then they would be wound up. They had received a telegram that day from New York stating exactly how their case stood. It was as follows:—"Plaintiffs' evidence closed. Nonsuit promptly refused. Defendants have opened. Confidence confirmed. Case to last till the middle of March." The only thing, therefore, between them and a verdict was the defence. The defendants had asked for a nonsuit, which, as the telegram stated, had been promptly refused. They had, therefore, gained the legal decision and a good deal depended on the decision of the Judge. They wanted the money to pay their counsel, Mr. Stoughton, 3000*l.*, and some of the gentlemen present might think this a large sum; but Park had engaged three counsel, and had paid them 5000*l.* each. The money might be raised by a voluntary assessment of the shares, but this they could not do; and the other mode was to issue debentures, which seemed to the Board the course they should adopt. They had no debentures, therefore the debentures would appear a good investment, but they called on the shareholders to subscribe for them on a higher ground—on the question of principle. They wanted to see this gross fraud exposed and punished.——In the course of discussion some objection was taken to paying 3000*l.* at once to Mr. Stoughton, and it was suggested that he should be offered instead, in the event of success, not only his 3000*l.* fee, but 2000*l.* in addition.——The CHAIRMAN, however, pointed out that Mr. Stoughton had already strongly refused to accede to any such proposition.——On the motion of Mr. G. RICHARDSON, seconded by Mr. TAYLOR, shareholder, a resolution was passed, requesting and authorising the directors to continue the prosecution of the company's actions now before the Court in New York, and to bring the same to a conclusion, and requesting them to exercise the powers given them under clause 75 of the Articles of Association, "and, in accordance therewith, to raise such sum or sums by the issue of debentures of not less than 10*l.* each," at such price and on such terms as they should think fit.——In reply to questions the CHAIRMAN said he was the largest shareholder in the company, and he and the other directors would subscribe for the debentures in proportion to their shares. They could not raise more than 100,000*l.*——Mr. RICHARDSON then moved, and Mr. M'GEORGE seconded, a resolution to the effect that the price of issue should be 2*l.* 10*s.* per 10*l.* debenture, and that they should bear interest at the rate of 6 per cent. per annum.——The resolution having been carried, a vote of thanks to the chairman terminated the proceedings.

FLAGSTAFF SILVER MINING COMPANY OF UTAH.

An extraordinary general meeting of shareholders was held at the Cannon-street Hotel, yesterday,

Mr. W. C. HARVEY in the chair.

The notice convening the meeting was read by Mr. A. A. METZ (the secretary).

The CHAIRMAN said the circular which had been sent round explained the object of the meeting, and why the steps therein proposed had not been taken before was that during the last eighteen months the attention of the directors had been principally devoted to getting possession of the property. Having obtained that, the directors wished to put the affairs upon a perfectly legal and sound basis; therefore the shareholders had been called together at the earliest possible opportunity to take into consideration this matter. He need make no further observation, but at once proceed to submit the resolutions contained in the notice calling the meeting. With regard to the first three resolutions, they would not be submitted to-day, but they would be put into one and proposed as one resolution at a confirmatory meeting, which would shortly be held. Therefore, the three first resolutions would be withdrawn for the present. He would, therefore, move the fourth resolution—"That the Articles of Association be altered by striking out Article 25, and in lieu thereof substituting the following:—'25. Every member shall have one vote for the first five or less number of shares held by him, and an additional vote for every additional five shares held by him beyond the first five up to 100 shares, and an additional vote for every ten shares beyond the first 100 shares, but no member shall be entitled to more than 10 votes.'" He presumed that no one would object to that.——Mr. PEARSON seconded the resolution, which was put and carried.

The CHAIRMAN then moved that the Articles be altered by striking out of Article 31 the words "shares standing in his own name solely of not less than 100*l.* in value," and in lieu thereof inserting the words "the having in his own name solely on the register of shareholders of the company not less than 20 shares." The directors considered that the present qualification was low, and ought to be increased.

Mr. THOMAS JOHNSTON seconded the resolution.

Mr. SNELL proposed as an amendment that the qualification of directors should be 300 shares each, which should have been held not less than two months.

The CHAIRMAN said he could not put the amendment. The resolution must be either accepted or negatived.

The resolution was then put and carried, with only three dissentients.

The CHAIRMAN next moved that the Articles be altered by striking out of Article 32 the words "the sum of 500*l.* each," and in lieu thereof inserting the words "such a sum as shall be at the rate of 250*l.* for each director, but such remuneration shall be divided amongst them as they shall from time to time determine." According to the Articles the present remuneration of the directors was 500*l.*, which the board had always thought very much too large.

Mr. PEARSON seconded the resolution.

Mr. TAYLOR thought that 150*l.* each would be sufficient till the company was paying a dividend. (No, no.)

After a short discussion the resolution was put and carried with only four dissentients.

The CHAIRMAN then moved that the Articles be altered by striking out of Article 37 the words and figures 100*l.* in," and in lieu thereof inserting the figures "10*l.*" He explained that this was a mere technical alteration in order to make the clause in accordance with previous clauses.——Mr. FAURE seconded the resolution, which was put and carried.

The CHAIRMAN then formally moved that the Articles be altered by striking out of Article 41 the words and figures "audit and notices (78 to 97 inclusive)," and in lieu thereof inserting the words and figures "and audit (78 to 94 inclusive)."

Mr. PEARSON seconded the resolution, which was carried.

The CHAIRMAN then moved that there be added to the Articles of Association, after Article 41, the following notices:—

"42.—A notice may be served by the company upon any member, either personally or by sending it through the post in a pre-paid letter addressed to the member at his registered place of abode.

43.—All notices directed to be given to the members shall, in respect to any share to which persons are jointly entitled, be given to whichever of such persons is named first in the register of members; and notice so given shall be sufficient notice to all the holders of such share.

44.—Any notice so sent through the post to any registered member shall be deemed to have been served on him on the day the letter containing it shall have been posted, and in proving such service it shall be sufficient to prove that such letter was properly addressed and put into the post office.

45.—Every member not resident in Great Britain or Ireland shall have at all times an agent so resident, who shall be lawfully authorised to receive, on behalf of the member, all notices which the member may be entitled to receive under

...Articles or otherwise, and the company shall not be bound to give any notice ...soever to any member not resident as aforesaid, otherwise than by giving the ...to an agent so resident and authorised.
...—Any member who shall not have such agent so resident and authorised, ...who, but for this provision, would be entitled to receive any notice from the ...any, shall not be entitled to notice, and may be treated and dealt with as ...g had notice, or as having agreed to dispense with notice, anything herein ...ined to the contrary in any respect notwithstanding.
...—Whenever there shall not have been registered in the books of the company ...ate of the last will or letters of administration of the estate of a person con... a member, or the husband of a female member, and whether such member ...g to be registered as member in the register of members, but who shall have ...a notice shall for all purposes be valid if addressed to the name of the person ...ntinuing registered as member, and left at his registered place of abode, or ...into the post-office addressed to the name of such person at such place of abode, ...withstanding the death of such person, and although the company may have ...express notice of his death."
This was seconded, and carried.

The CHAIRMAN said that finished the business for which the shareholders had been called together. The directors had sent out a notice to the effect that the Supreme Court of Utah had confirmed the company in the possession of their property. Mr. Patrick and Mr. Davis had appealed to the Supreme Court of Utah, but the appeal had been dismissed, and his contracts declared to be fraudulent and void. He had that morning received a telegram to the effect that the mine was work... satisfactorily, that the sales were 65 tons daily, and everything all right. He had in his hands documents and affidavits which conclusively proved that but for the steps which the directors had taken in the interests of the shareholders, in two months the property would not have been worth anything.

In compliance with the request of the meeting, the secretary read a long report which had been received from Mr. Lockwood, a mining engineer of undoubted repute in Salt Lake city.

MR. TAYLOR asked for some information regarding the position of the mine.

Prof. VINCENT referred to a coloured representation of the workings of the mine as they existed at the time of his visit in April last, and said that at that time the ore which was being obtained was taken from the bottom of the mine. The facilities for hoisting were equal to a power of about 5 tons per hour, or 120 tons in 24 hours, and the cost at which the ores could be got at and realised was sufficiently moderate to allow a very handsome profit. The disparity between his estimate of the aggregate cost and that of Mr. Lockwood was accounted for by the fact that at times the ores were found in different conditions, and were sometimes harder to work than at other times. The Flagstaff was situated in the limestone formation, which was a particularly congenial horne or matrix for the production of silver-lead ore. In that formation at home was the celebrated Alston Moor Mine, and in the same formation there were valuable and permanent mines in Sweden, Belgium, Hungary, Sicily, Spain, Sardinia, and in various districts of America, amongst others the Eberhardt and Aurora, to the future of which he looked with great hope and confidence. There was also the successful Richmond Hunter was opening up the mine. He had great faith in the continuance of the ore on both sides of the shaft, where there was a large area of unexplored ground, and in conclusion, expressed his belief that in the Flagstaff the shareholders possessed a rich and permanent mine. (Cheers.)

He bore testimony to the energetic and excellent manner in which Mr.

A vote of thanks was then passed to the Chairman and directors, and the meeting broke up.

WHEAL GRENVILLE MINING COMPANY.

A special meeting of shareholders was held at the offices of the company, St. Andrew House, Cornhill, on Thursday—Mr. GOOLD in the chair—for the purpose of confirming, or otherwise, the following resolutions passed at the special general meeting held on Feb. 6 :—

That having considered the reports of the agents now read, it is expedient and necessary in the interests of the adventurers that a new and more powerful engine should be erected on the mine with as little delay as possible. That the committee be empowered to take such steps for the purchase of an engine and other machinery as they may in their judgment deem necessary. Also for the purpose of amending rule No. 1 of the rules and regulations of the company, authorising the appointment of not more than three persons as members of the committee, and substituting the following in its stead :—"There shall be a committee consisting of not less than three persons, who shall have the management of the affairs of the adventure, subject to the directions and resolutions passed at general or special meetings, and who shall have the custody of all deeds, leases, accounts, books, moneys, and funds the property of the adventurers, and shall be responsible for the receipt and disbursement of the said moneys and funds, but not for any loss or damage that may accrue to the property of this adventure, except it arise from his or their own neglect, waste, or malpractice."

Mr. T. B. LAWS (secretary) read the notice convening the meeting.

The CHAIRMAN said that on Feb. 6 the shareholders met for the purpose of considering the advisability of erecting new machinery on the mine, and reports were laid before the shareholders on that day. Those reports were very voluminous, and dealt with the matter very exhaustively, and there was very little difference of opinion on the part of those who made those reports. One mining captain whom the directors had had an interview with before was strongly of opinion that such a course would scarcely be possible, looking to the present price of tin and the prospects of the company, but he thought he could see his way to a certain alteration of the existing machinery on the mine whereby it might be carried down 10 or 15 fms. deeper, and thus show what was its value at the great junction, but that mining captain, after a full consideration of the facts laid before him, agreed with the others that it would not be advisable to do as he said, but rather that the company should incur the additional expense, so as to place the company in a few months from the present time in a position to be sinking. So the resolution was passed unanimously. It was not his intention to travel over the same ground again to-day unless there should happen to be present gentlemen who were not present at the last meeting, and would like him to do so. Since then the subject had given him the gravest interest, because he was a very large holder in the mine, but the more he had thought of it the more he had determined in his own mind that the course which the shareholders sanctioned on that day was the only one they could adopt with prudence and with a true appreciation of the interests of the shareholders in this matter. In conclusion, he (the Chairman) moved the confirmation of the resolution.

Mr. SHERWOOD: Have you ascertained the estimated expenses of the machinery?

The CHAIRMAN said the estimate was between 3500*l.* to 4500*l.*, but much would depend upon whether they got a second-hand engine or a new one.

Mr. SHERWOOD said he understood that the mine had almost met its own expenses?—The CHAIRMAN said that was correct. At the moment when they had to stop in consequence of the water the mine was just on the point of paying its way.—The CHAIRMAN, in answer to a further remark, said he could give them the evidence of Capt. Boynes, who was of opinion that the lode would improve in depth, and to all appearances there was an unbounded quantity of tin in this lode, which it would take an age to extract. He went on to say that no sinking of any importance could have been carried on without the engine; in fact, since the present management had come into office they had not been able to sink 6 in. The season was exceptionally wet, and the existing machinery was inadequate to the performance of the required work, and he was really surprised that some catastrophe had not happened. As it was there had been continual mishaps. He thought there was no hope for the company, except in sinking. With the new engine the water could be kept under, and the ground sunk to a considerable depth. Referring to its position now, as contrasted with when the management came into office, he said he thought it was worth double what it was 12 months ago. There was every reason to believe that the junction must prove richer. Personally speaking, he had gone on purchasing until his interest now was about 600 shares. The mining agent at Dolcoath had expressed a high opinion of the property, and had said, "I have known the district for 40 years; you have a big lode running through the whole of your property which will get richer and richer. I know you have no less than six cross-courses or caunter lodes running into it, every one of which must divide this main lode in depth, and the increase in the height of the lode you will get in the next 70 fms. of sinking."

A SHAREHOLDER asked how long it would be before the new engine was set to work?—The CHAIRMAN said it would be about nine months. It would be an 80-inch engine, certainly not less. Speaking of the *Mining Journal*, he characterised the statements which appeared therein as persistent attacks upon the management, which the board would not condescend to notice. Why those attacks appeared he did not know, nor did it become a paper of the high standing of the *Mining Journal* to allow those attacks to be so persistently indulged in.

Mr. RAWLINGS spoke highly of the mine, and said his partner, Mr. Husband, and himself had increased their stake in the company. He thought that the property under the present management was in a fair way to recoup the shareholders, and he congratulated them upon the steps they were taking to provide sufficient engine-power.

Mr. WADDINGTON then seconded the motion, which was put and carried.

An enquiry as to the amount of the outstanding calls elicited the information that the amount was 52*l.*

The ordinary meeting was then held, at which the CHAIRMAN simply moved the adoption of the accounts and other documents.—Mr. SHERWOOD seconded the resolution, which was put and carried.

A call of 10*s.* per share was then decided upon. A cordial vote of thanks to the Chairman closed the proceedings.

BOTALLACK MINE.

At the quarterly meeting of shareholders, held at the mine, on Wednesday, the accounts for the three months ending December showed—Wages, 3333*l.* 9*s.* 8*d.*; coals, 572*l.* 16*s.* 8*d.*; carriage, 258*l.* 11*s.* 7*d.*; timber, 200*l.*; sundries, rents, &c., 226*l.* 4*s.* 3*d.*; merchants' bills, 556*l.* 2*s.* 1*d.*; arsenic (credited last account), 150*l.*; balance profit on three months, 202*l.* 11*s.* 10*d.*: total, 5429*l.* 16*s.* 1*d.* —Credits, copper ores, 45 tons (less dues), 438*l.* 18*s.* 8*d.*; tin ores, Botallack, 53½ tons (less dues), 2206*l.* 15*s.* 6*d.*; Truthall, 37 tons (less dues), 1626*l.* 13*s.* 1*d.*; Carnyorth, 26¼ tons (less dues), 819*l.* 10*s.* 7*d.*; arsenic, 333*l.* 11*s.* 4*d.*; sundries, 74*l.* 6*s.* 11*d.*: total credits, 5499*l.* 16*s.* 1*d.* The balance due from adventurers at the last account was 2569*l.* 3*s.* 4*d.*, deducting from this the surplus profit, as shown above, on the past three months 202*l.* 11*s.* 10*d.*, and call received, &c., 21*l.* 8*s.* 8*d.*, leaves a balance now due from the adventurers of 2345*l.* 2*s.* 10*d.*

The agents report stated that at Wheal Loor the 150 and 130 east are driving and opening good tin ground. A winze sinking under the 110 east is productive for tin. The 90 south, on Corpus Christi, and the 60 east, on Wheal Loor, are being cleared preparatory to driving; here are 27 men and boys opening ground, and 24 men and boys stoping ground on tribute and tutwork. At Wheal Cook the skip-shaft has been sunk to the 150, and the men are now cutting skip-plat at the 135. The 150 east is producing tin, and a winze sinking under the 125 east is yielding paying ground. In the 112 east the Corpus Christi lode has been discovered; lode looking very promising for both tin and copper. The end driving west and a cross-cut at the 112 west and a winze sinking under this level are opening payable ground for both tin and copper. The driving of the 100 south has been recommenced. The lode in the 85 west has improved; here are 51 men and boys opening ground and 33 men and boys stoping ground on tutwork and tribute. At Carnyorth the 100 east and west, on new lode, are opening tin ground of good quality, also a winze sinking under the 64 west, on Nogger, and the 40 and 30 west, on Rodd's, are opening productive ground; here are 10 men opening and 35 men and boys working ground on tribute. The tin-producing parts of the mine are looking quite as favourable as were reported at the last account, but the copper parts are not quite so promising. The ground opened in three months in shafts, levels, and winzes is 104 fathoms. The average price of the tin credited in the account is 43*l.* per ton. The highest price realised was at Treloweth, Nov. 25 last, sold for 43*l.* per ton, and on Feb. 19, at Chyandour, the price sold for was 44*l.* per ton, and on Feb. 13, at Trereiffe, at 44*l.* per ton. The tin sales during the three months were 110 tons.

WEST TOLGUS MINING COMPANY.

A two-monthly meeting of adventurers was held at the mine on Wednesday,—Mr. RICHARD TAYLOR presiding.

The accounts showed a profit on the two months' working of 718*l.* 8*s.* 10*d.* At last account there was a credit balance of 375*l.* 2*s.* 4*d.*, and it was now determined to declare a dividend of (512*l.*) 1*l.* per share, and to carry forward the remainder, thereby increasing the balance to 518*l.* 11*s.* 2*d.*

In concluding their report, the agents said—"The ores sold for the next account give, after deducting the lord's dues, 3049*l.* 9*s.* 3*d.*, which is about 800*l.* less than the amount credited in the accounts on the present occasion. The costs will, we expect, be about 300*l.* less than those of the last two months, so that a profit of a little more than 200*l.* will be made."

The CHAIRMAN, alluding to the references made in the report to the amount of water they had had in the mine in consequence of the incessant rain, said he had no doubt that many other mines in the county had been placed in a similar difficulty, and even a worse position, and, therefore, perhaps they had not any special cause of complaint. It would be admitted at the same time that an old engine like theirs having to be driven so fast in order to keep the water down had done remarkably good work. The breakage referred to was one that could not have been averted.

The report and accounts having been passed,

The CHAIRMAN mentioned that some years ago, when the mine was not paying dividends, Lord Robartes, the lord of the mine, generously reduced the dues from 1-20th to 1-40th, and that scale had been in force ever since. But the mine had now been paying dividends for some time, and it was quite understood that from this moment they would have to revert to the old rate of dues. Recently, however, a communication had been received from his lordship, in which he stated that, in appreciation of the difficulties against which the mine had lately had to contend, he would not ask for the increased rate for another six months.—This announcement was received with loud applause, and a cordial vote of thanks was given to his lordship for his liberality.

PHOSPHOR BRONZE COMPANY.

The annual general meeting of shareholders was held at the company's offices, Cannon-street, on Wednesday,

Rear-Admiral Sir J. E. COMMERELL, K.C.B., V.C, in the chair.

Mr. R. LAGERWALL (the secretary) read the notice convening the meeting, and the statement of accounts, together with the report of the directors, was submitted.

The directors congratulate the shareholders on the favourable results attained and the prosperous state of the company's business. When the depression in trade generally, and more particularly in the iron, steel, and engineering branches during the past year, is taken into consideration, the progress of the company's business under such adverse circumstances may be regarded as peculiarly satisfactory. The total amount of metal sold has been considerably greater than in 1875, and a large number of new and influential customers has been secured. A very gratifying feature in the business of the company during the past year has been the supply of castings to the principal steamship owners. About 50 of the largest British ocean-going steamships have been furnished by the company with phosphor bronze castings, such as bearings, slide-valve facings, eccentric straps, piston rings, shoe guide blocks, liners, &c., and many other steamers have no doubt obtained the castings of phosphor bronze from brassfounders, who have been large purchasers from the company of ingots for re-casting.

The Government continue to employ the company's metal largely in the various departments of the Royal Arsenals, and also in the foundries in India. Seventeen vessels of the Royal Navy have during the past year been furnished with phosphor bronze parts of machinery, &c. The business of the company is going on steadily, with every prospect of a continuous increase. The orders from the railway companies iron and engineering works have, notwithstanding the dulness of trade, been considerably larger, and many novel applications for phosphor bronze have been discovered; some of them, such as for harness fittings and steam fittings, being likely to lead to an extensive use of the metal at home and abroad. An interim dividend of 2½ per cent. for the half-year ending June 30 has already been paid, and the directors now propose a further dividend which shall make the distribution for the year equivalent to 10 per cent. per annum, free of income tax, on the paid-up capital.

Considerable discussion followed as to the advisability of declaring so large a dividend as 10 per cent., but the directors having satisfied the meeting that the financial condition of the company justified it, the report was unanimously adopted, and the declaration of the dividend agreed to.

The retiring directors and auditors were re-elected, and thanks having been voted to the Chairman, directors, and secretary the proceedings terminated.

PROFITABLE MINING.—The report of the California Mining Company (Virginia, Nevada) states that the payment of monthly dividends of $2 per share ($1,080,000) commenced on May 15 last, and while the stockholders have been kept in constant alarm by sensational rumours, given greater publicity by journals purporting to furnish reliable information, the mine has continued to give the necessary amount of bullion for the payment of these dividends. The following statement shows to what importance the mining business has grown, and how extensively the stock of this company figures in it. There have been transferred during the year 850,000 shares; as every transfer indicates a transaction, by placing the average price for the year at $80, we find that $51,000,000 represents the aggregate of these transactions. The California Mine has yielded during the year ending Dec. 31, 1876, 128,800 tons of ore. Of this ore 127,540 tons have been reduced, leaving on hand in the ore houses and at mills 1260 tons, valued by assay at $119,000. The ore reduced has yielded bullion of the value of $13,400,841·40, being 73½ per cent. of the assay value of the ore. The value of the gold in bullion was $6,488,640·58, and of the silver $6,912,200·82. The average yield of the ore per ton is 105·07.—The Consolidated Virginia annual report states that the first dividend was declared in May, 1874, and dividends to number 32 were continued monthly to and including December, 1876. The amount of bullion is $39,002,110·45, and the dividends paid $27,090,000. The capital stock of the company is now 540,000 shares of the par value of $100 each. Each share has paid $50 in dividends, besides the stock dividend of 7-12ths of a share of California. The total quantity of ore which has been taken out from the Consolidated Virginia Mine during the year ending Dec. 31 is 142,678 tons. There were remaining on hand in the ore house and at the mills at the beginning of the year 2988 tons. There have been reduced 145,466 tons, yielding bullion of the value of $16,661,940·70, this yield being 73¾ per cent. of the assay value of the ore—no deduction having been made for wet ore. They have now in the ore houses and at the mills 200 tons, valued by assay at $28,471.

WHEAL UNITY WOOD.—At the meeting, on Thursday (Mr. H. Michell in the chair), the accounts showed a debit balance of 1517*l.* 10*s.* 5*d.* A call of 5*s.* per share was made, which, after allowing discount for prompt payment, will realise about 1200*l.* The purser and manager were empowered to take what proceedings might be necessary to enforce the payment of all calls in arrears. Mr. W. Michell spoke very hopefully of the future of tin mining. Four or five years ago he received reliable information of the then approaching struggle, and took his precautions accordingly, and he was now equally convinced that in less than 12 months they would see a rise in tin of from 10*l.* to 20*l.* a ton.

COURT GRANGE.—At the meeting, on Feb. 16 (Mr. T. E. Foakes in the chair), the directors report that owing to inability to obtain calls from shareholders the mine has been at a standstill, except keeping the pumps going. Several alterations in the company's Articles were made, whereby the directors are authorised to mortgage the whole of the property or issue bonds or debentures to raise money. The retiring directors and auditor were re-appointed.

TRELEIGH WOOD.—At the meeting of shareholders, on Wednesday (Mr. T. V. Smith in the chair), the accounts showed a cash balance of 317*l.* 4*s.* 10*d.*, and a balance of liabilities over assets of 1080*l.* 11. 4*d.* A call of 5*s.* per share was made. A relinquishment of 20 shares was accepted. Capts. E. Hoskings and Wm. Goldsworthy reported upon the various points of operation. They estimate their next 12 weeks' cost at 400*l.* per month, and their returns at 320*l.* per month for tin, besides which they will sell a little copper. They sold 51*l.* worth of copper in December and 33*l.* worth on Feb. 1. The mine is yielding greater returns, with less cost than it has done, and with a little better price for tin would be leaving a profit.

ALVIGGAN AND BURNGULLOW TIN MINING COMPANY.—At the meeting, on Saturday, the directors stated that the engine-house with stack, store, and smiths' shop have since been built, and the directors have purchased a 30-inch cylinder engine, by Nicholls, Williams, and Co., and a 10-ton boiler with all the interior fittings of the engine-house, of sufficient power to do the pumping, winding, and crushing, for the sum of 600*l.* This is now being erected under the superintendence of Messrs. Loam and Son, of Liskeard, and is expected to be completed in about a month's time, the outside connections having yet to be made before it can be in efficient order for working.

Mr. John Mellor has resigned his seat on the board of directors of Rylands and Sons, Manchester and London.

HOLLOWAY'S OINTMENT AND PILLS.—A frequent cause of gout and rheumatism is the inflammatory state of the blood, attended with bad digestion and general debility. A few doses of these pills, taken in time, are an effectual preventitive against gout and rheumatism, but anyone who has an attack of either should use Holloway's ointment also, the powerful properties of which, combined with the effects of the pills, must infallibly effect a cure. These pills act directly on the blood, which they purify and improve; they also regulate the secretions, and give tone to the stomach, and thus the whole system is invigorated, and put into a condition which enables it to throw off disease or check its approach.

Registration of New Companies.

The following joint-stock companies have been duly registered:—

D'ERESBY MOUNTAIN MINING COMPANY (Limited).—Capital 10,240*l.*, in 20*l.* shares. To purchase and take over the mines and minerals under lands named Fuchaslas and Guden-Llifon, situate in the township of Gwyder, Carnarvon. The subscribers (who take one share each) are—J. Y. Watson, St. Michael's-alley, mineowner; S. W. Dawkes, 7, Whitehall-place, no occupation; H. W. Lamb, Anerley, no occupation; N. F. Watson, St. Michael's alley, sharedealer; Jehu Hitchins, St. Michael's House, mining engineer; Theodore Paul, 4, Oxford Villas, Hammersmith, civil engineer; C. B. Parry, St. Michael's House, mining agent. The directors are—Messrs. S. W. Dawkes, H. W. Lamb, and J. Y. Watson, the qualification being the holding of four shares, and remuneration 200*l.* per annum.

DOOM DOOMA TEA COMPANY (Limited).—Capital 150,000*l.*, in 10*l.* shares. To acquire the Doom Dooma Tea Estate and the Fort Tea Estate, Upper Assam. The subscribers (who take one share each) are—Henry Hopkinson, 7, Granville-place, South Kensington; James Warren, Capel House, Enfield; F. Appleford, The Cedars, Stoke Newington; Edward Paice, 135, Brecknock-road; N. W. W. Carter, Gladding-road, Manor Park, Essex; E. R. Slocombe, The Hollies, Teddington; Thos. Mee, 2, Great Winchester-street Buildings.

INTERNATIONAL AUTOMATIC ADVERTISING COMPANY (Limited).—Capital 100,000*l.*, in 10*l.* shares. To acquire a patent invention of Mr. C. L. A. Couture for an automatic advertising apparatus for the exhibition of movable advertisements, &c. The subscribers (who take one share each) are—Edward Schubert, 32, St. Swithin's-lane; J. de la G. d'Devonne, Paris; W. B. Heath, Bryanstone House, Anerley; Cte. Pinsant di Suraimuorht, Paris; A. Burmester, 3, Pancras-lane; T. W. Martin, 32, St. Swithin's-lane; A. Paritt, Irving-grove, Stockwell.

WORKMEN'S INSTITUTE AND REFRESHMENT ROOMS COMPANY (Limited).—Capital 10,000*l.*, in 1*l.* shares. This is a Southampton company.

GURRINGTON SLATE QUARRIES (Limited).—Capital 13,000*l.*, in 10*l.* shares. To acquire the right, title, and interest of Mr. James Murray, in stone, &c., upon land known as the Quarries Estate, Woodland, Devon. The subscribers (who take one share each) are—James Murray, Victoria Park, Torquay, estate agent; Thos. Perry, 9, Castle-terrace, Torquay, accountant; Southam Cash, Victoria and Albert Hotel, Torquay, mining engineer; W. A. Gass, Torquay, builder; C. E. Rivers, Torquay, builder; C. E. Rivers, Torquay, accountant; H. Toop, Torquay, builder. The directors are Messrs. W. E. Wordon, James Murray, and Thomas Glover. For any future director other than these genntlemen, or their nominees, the qualification is the holding of shares to the value of 250*l.*

HAND-POWER ROCK DRILL COMPANY (Limited).—Capital 2000*l.*, in 10*l.* shares. To acquire and work machinery for rock drilling, excavating, sinking mines, quarrying, &c. The subscribers are—E. T. Brooks, Southampton Buildings; Thomas Jordan, 63, Queen Victoria-street, engineer, 5; T. W. Rowland Jordan, 63, Queen Victoria-street, engineer, 5; William Kenrick, Birmingham, contractor, 5; Thomas Reinter Wrexham, esquire, 5; F. Wheeler, 63, Queen Victoria-street, architect, 1; T. Winshall, 8, Victoria Chambers, civil engineer, 1; A. A. Kenrick, Birmingham, metal broker.

BOSCOMBE PARK ESTATE COMPANY (Limited).—Capital 21,000*l.*, in 50*l.* shares. To purchase and sell land, &c. The subscribers (who take one share each) are—W. H. Davis, 29, High-street, Southampton; W. E. Wheaton, Landerdale House, Exeter Park, Bournemouth; T. E. Kennion, Bournemouth; George Wilt, Christchurch, Hants; T. E. Mussell, High-street, Ringwood; C. T. Mill, Bournemouth; F. Ransche, Boscombe.

HIGH SCHOOL FOR BOYS, PLYMOUTH (Limited).—Capital 50,000*l.*, in 25*l.* shares. To establish a school at Plymouth. The subscribers are—the Bishop of Exeter, 2; Montague Bere, Plymouth, 4; C. T. Wilkinson, Plymouth, 2; W. T. Collier, Woodlands, Devon, 4; C. Wilson, Plymouth; Robt. Bayley, Torr Grove, 4; B. Bird, Plymouth, 1.

WEST OF ENGLAND STEAMSHIP OWNERS PROTECTION ASSOCIATION.—This company is "limited by guarantee," and is formed for the mutual protection of its members against certain events referred to in the 54th section of the Merchant Shipping Amendment Act, as well as against risks not covered by an ordinary policy at Lloyds. The subscribers are—E. H. Watts, 85, Gracechurch-street; James Dixon, jun., 81, Gracechurch-street; G. Jimman, 110, Cannon-street; W. B. Benson, 2½, Fenchurch-street; Gilbert Porteous, 2, East India Avenue; W. H. Wise, jun., West Hartlepool; John Holman, 23, St. Mary Axe; Richard Holman 23, St. Mary Axe.

SHIPOWNERS' PROTECTION ASSOCIATION.—This company is limited by guarantee, and is formed for the same purpose as its predecessor.

RED CROSS MUTUAL STEAMSHIP INSURANCE ASSOCIATION.—This company is also limited by guarantee, the object being the mutual assurance of ships belonging to members. The subscribers are—J. R. Gillespy, 2, Brabant-court; John Johnasson, 18, Leadenhall-street; H. G. Temperley, 21, Billiter-street; H. W. Carter, 21, Billiter street; G. Jinman, 110, Cannon-street; W. H. Turney, 15, Great St. Helen's; W. G. Westall, 9, Fenchurch street; J. J. Holdworth, 13, John-street; E. B. Scott, 2, Brabant-court.

DAVIS'S EXCELSIOR KNIFE CLEANING MACHINE COMPANY (Limited).—Capital 10,000*l.*, in 10*l.* shares. To acquire the right to make and sell Davis's knife cleaning machines, &c. The subscribers are—A. Taylor, Bath House, Lewisham, 100; N. Sadler, Horsham, 50; T. Starkie, Croydon, 100; J. G. Hitchings, South Hackney, 1; J. J Reeves, 69, Leadenhall-street; J. C. Davis, 87, Tollington Park; C. H. Davis, 87, Tollington Park.

SLACK'S EMERY WHEEL AND MACHINE COMPANY (Limited).—Capital 12,000*l.*, in 10*l.* shares. To acquire the business of Mr. Samuel Slack, of Manchester, emery wheel machine maker, &c. The subscribers (who take one share each) are—Samuel Slack, Chesterfield; Robt. Lake, Stamford; S. Humbler; Derby; N. G. Kimberley, 13, Portland-street, Leeds; F. J. Clayton, Broomhall, Sheffield; J. W. Telfer, Glassop-road, Sheffield; P. Naskham, Sheffield.

MILNROW BRICK AND TILE COMPANY (Limited).—Capital 10,000*l.*, in 50*l.* shares. To acquire quarries and mines, beds of clay, &c., in the parish of Rochdale, and to carry on business as brick and tile makers. The first seven subscribers (who take one share each) are—William Clegg, Milnrow, near Rochdale, woollen merchant; Emanuel Clegg, Melnrow, woollen merchant; E. Clegg, Melnrow, woollen manufacturer; H. Blackburn, Melnrow, woollen manufacturer; W. Jones, Melnrow, cotton manufacturer; James Ray, Melnrow, woollen manufacturer; Thomas Taylor, Melnrow, mill overlooker. The directors (who take five shares each) are—William Clegg, James Heath, Wm. Jones, James Ray, E. Clegg, and H. B. Blackman, the qualification being five shares.

BARROW BREWERY COMPANY (Limitad).—Capital 20,000*l.*, in 5*l.* shares. To acquire a brewery at Barrow-in-Furness. The subscribers are—Joseph Hartley, Queen's Hotel, Barrow, 50; J. Barnes, Hallgate Farm, Carnforth, 30; Joseph Hunter, Barrow, 10; J. Hodgson, Barrow, 5; James Beesley, Barrow, 2.

UNITED STATES MORTGAGE BANK (Limited).—Capital 1,000,000*l.* sterling, or $5,000,000, in 50,000 shares of 20*l.*, or $100 each. Of these 49,000 are ordinary, and 100 founders' shares. To carry on the business of borrowing money in England and elsewhere, and receiving the same on deposit, and lending it out on security of real estate and other immovable property in the United States. The subscribers (who take one share each) are—H. G. Smallman, 17, Loughborough road, Brixton, law student; W. D. Milner, East Moseley, law student; Frank Murels, 9, St. George's terrace, solicitors' clerk; J. Smithers, 35, Burton-road, Brixton, managing clerk; Walter Hughes, 33, Abchurch-lane; W. W. Hughes, 50, Harley-street, coal factor; John Galbin, Victoria Lodge, Holloway, shorthand writer.

BRUNDAGE'S FORGED HORSE-SHOE NAIL COMPANY (Limited).—Capital 30,000*l.*, in 25*l.* shares. To purchase letters patent for improvements in machinery for manufacturing nails and brads, and also for forging horse and shoe nails. The subscribers (who take one share each) are—John Bacher, 14, Parkrow, Leeds; Charles Richard Farmer, Gainsborough, iron merchant; J. B. Hargreaves, Willgarth House, Armley, Leeds; T. E. Craven, Victoria Chambers, Leeds. W. A. Scott; E. L. Brundage, Leeds; John Priestley, Bolton.

TRIMSARAN WAGON COMPANY (Limited).—Capital 10,000*l.*, in 10*l.* shares. To manufacture and build railway and other wagons, &c. The subscribers (who take one share each) are—W. J. Alt, Woburn Park, Weybridge; Thos. Belt, 21, Old Broad-street; H. N. Simons, 21, St. Swithin's-lane; F. Pock, 4, Fenchurch-street; William Paterson, Sydenham Hill; E. Clark, Lapeswood, Sydenham; W. R. Winch, 4, Fenchurch street.

H. B. KENDRICK AND COMPANY (Limited).—Capital 10,000*l.*, in 5*l.* shares. To carry on business as dealers in woollen cloth. The subscribers are—H. B. Kendrick, 64, Basinghall-street, 50; Henry Crabtree, Stanley street, Heywood, Lancashire, 50; J. Davenport, Oldham; J. Thorp, Golcar, 50; B. Gledhill, Golcar, 30 J. Quarmby, Golcar, 50; J. Wilson, Golcar, 30.

FALMOUTH POTTERIES AND FIRE-BRICK WORKS (Limited).—Capital 20,000*l.*, in 10*l.* shares. To work for fire and other clays to be found in certain lands and quarries at West Trevarth and Casgarne, parish of Gwennap, near Redruth, Cornwall. The subscribers (who take one share each) are George Smith, Coalville, Leicester engineer; G. H. Ellis, Crofton Lodge, Stevenage, engineer; M. V. Doubleday, Burgess Hill, Sussex, granite merchant; T. A. Ellis, 42, Hart-street, Bloomsbury, engineer; George Thorne, 158, Portsdoune-road, W., no occupation; D. Fryer, 18, Carlton-square, Old Kent-road, no occupation; John Lloyd, Torriano-avenue, Camden-road, secretary. The directors are Messrs. George Smith, G. H. Ellis, and H. V. Doubleday; the qualification being the holding of 25 shares.

CASSEL TRAMWAYS COMPANY (Limited).—Capital 25,000*l.*, in shares of 2*l.* 10*s.* each. To adopt a contract made between A. T. Jay and J. L. Walker of the one part, and the Cassel Tramways Company of the other, for the transfer of concessions for a tramway at Cassel. The subscribers are—Sir J. G. S. Sebright, 27, Lowndes-square, 80; Gerard de Wilte, 37, Alfred-place West, South Kensington, 80; W. Allison, the Grove, Kensington, 80; Ralph Mitchell, 7, Union-court, Old Broad-street, 1; J. E. Helley, 55, Finchley New-road, N., 1; R. A. Harding, Putney, 1; F. Raimilton, 45, Mornington-road, Regents Park, 1.

CASTLE CALDWELL CEMENT COMPANY (Limited).—Capital 10,000*l.*, in 5*l.* shares. To carry on business as lime and cement dealers, and to acquire the Caldwell Cement Works, in the county Fermanagh, Ireland, together with any mines, lands, and quarries in connection therewith. The subscribers are—H. Y. D. Scott, Sunnyside, Ealing, major-general, C.B., 20; S. C. H. Bushe, 10, Eldon-road, Kensington, law student, 20; G. R. Redgrave, C.E., Sunnyside, Muswell Hill, 20; L. C. Sayles, 6, New square, Lincoln's Inn, barrister-at-law, 10; F. M. Redgrave, 18, Hyde Park Gate, spinster, 10; E. L. Redgrave, 18, Hyde Park Gate, spinster; MacLeod MacLeod, Isle of Skye, assistant secretary Art and Science Department. The directors are—Major-General H. Y. D. Scott, J. C. Bloomfield, G. R. Redgrave, and J. H. Bridgeford, the qualification bring the holding of 20 shares.

ALBION FLINT GLASS COMPANY (Limited).—Capital 10,000*l.*, in 10*l.* shares. To acquire the business of Messrs. McDermott, Dove, and Co., of Newcastle. The subscribers are—Thomas McDermott, 15, Clayton-street, Newcastle, 200; T. R. Dove, Newcastle, 200; J. A. Scott, Nicholas Buildings, Newcastle, 120; J. Jameson, Newcastle, 20; John Lucas, Gateshead, 20; T. Arnott, 13, Pilgrim-street, Newcastle, 10; T. W. Weghtman, Gateshead, 20; and W. Richardson, Benton, 10.

CORK-CUTTING COMPANY (Limited).—Capital 10,000*l.*, in 2*l.* shares. To acquire and work patents for improvements in machinery for cutting corks. The subscribers (who take one share each) are—James Burlige, 4, Mount Pleasant, Hornsey; F. Schofield, City-road; H. Potter, Beverley-road, Barnes; R. Hallam, 63, Oldfield-road, Stoke Newington; T. M. Holdway, Palmerston-road, Forest Gate; F. L. Jeys, 41, Threadneedle-street; C. Rolfe, 26, Campbell-road.

NOVELTY THEATRE COMPANY (Limited).—Capital 5000, in 25*l.* shares. To lease or otherwise acquire theatres or halls for the purpose of giving novel entertainments, &c.

NEW HIDE AND SKIN COMPANY, SHEFFIELD (Limited).—Capital 5000*l.*, in 5*l.* shares. To carry on business as wool staplers and dealers in skins.

FOREIGN MINES.

ST. JOHN DEL REY.—Telegram from Morro Velho, dated Rio de Janeiro, Feb. 20: Produce for the month of January, 33,500 oits.=12,980ℓ.; yield, 6·1 oits. per ton. Produce small, from large temporary admixture of killas. Heavy rains have caused landslips, with considerable damage. Duty of stamps short, from breakage of water-course.

RICHMOND.—Week's run, $55,000; week's produce of refinery, $32,000.

— R. Rickard, Feb. 3: Operations in the mine were again resumed on Monday morning. The 800 drift on contract has been extended 50 ft. without any change in the ground. No. 1 winze is down 40 ft., the bottom is in limestone; the sinking has been stopped, and a drift started to intersect the ore which crossed the winze above. No. 2 winze is also down 40 ft., the ground is easy for sinking, but no ore of any value. The stopes are about the same as last reported. In drifting in the footwall at the 600 we cut a vein of very good ore; it is looking very promising. The 400 is looking well, it is widening as we rise on it; it has very much improved. All the furnaces are again in full blast; they were started on Monday, and have been working very satisfactorily ever since.

CHICAGO.—Telegram: Net profit for January, $5000.

EBERHARDT AND AURORA.—The directors have received a further shipment of bar silver, valued at present price about 5000ℓ.

NEW ZEALAND KAPANGA (Gold).—J. Thomas writes—Since last message we have driven No. 5 level towards the Coromandel shute of gold 16 ft., and sunk the winze under the level 12 ft. Prospects good.

LONDON AND CALIFORNIA.—The clean-up at the Original Amador Mine for the month of January is estimated at $8000.

SIERRA BUTTES.—Result of the working at the Sierra Buttes and Plumas Eureka Mines for January—Sierra Buttes: Receipts, $31,975; total California expenses, including cost of mining and milling, $20,611.—Plumas Eureka: Receipts (including sulphurets), $44,604; total California expenses, including cost of mining and milling, $17,800. Tons of sulphurets saved, 39; amalgamated, 37; yield of sulphurets per ton, $100.

SANTA BARBARA.—Mine Captain's Report for December: Stope No. 1: The lode for the whole height of this stope is very small and poor, and it is considered advisable to suspend the stoping of it, and drive at the bottom of the same for stopes below.—No. 2 Stope: The lode in this stope is 4 feet wide, and of rather low quality mineral.—No. 3 Stope and Adit Level: The lode in this stope is 9 ft. wide, of fair quality mineral.—No. 4 Stope South: The lode in this stope is 9 ft. wide, of good quality mineral. The lode in the end at the top of this stope and under the pillar is 2 ft. wide, containing lines of good mineral.—No. 5 Stope North: The lode in this stope is 6 ft. wide, of rather inferior quality mineral: the part towards the hanging-wall contains a large amount of hornblende. All the force available, without injury to the output, had been employed in getting out the foundation for the new hauling machine. The quantity of ore raised during the month of December amounted to 1325 tons, of which 315 tons were rejected as refuse stone, and 1010 tons treated at the stamps. The average quantity of ore raised per borer for the month was 28·9 tons.

SWEETLAND CREEK (Gold).—G. D. McLean, Jan. 30: It is raining, and water promises to be more plentiful: however, we have not been much stinted, our requirements being much less than formerly. We are washing away slowly, with no change to note. There is no improvement in the southern end of the mine, where we are making the present run. The stuff is still trashy and poor. We do not anticipate any profit, and may run something behind. We are economising, however, to avoid the latter, if possible. I think, should we run behind materially, we had better shut down until we can more cheaply work, or expenses lessen. Nothing of further interest.

BIRDSEYE CREEK (Gold).—G. S. Powers, Jan. 28: The storm which was raging at the date of my last letter continued until the 19th, when it cleared off dry and cold, leaving us with but little more water than before, but on account of the blockade with snow in South Yuba ditch we have had about 500 inches extra water from that company's ditch whilst they have been running snow; they have now got their ditch on this side clear, and we shall not be likely to get more water from that company in the same manner. I have been using the water since the 21st inst. at Neece and West and Waloupa to the best advantage possible. Waloupa is working so far most favourable, and I have not yet used any powder in bank blasting, and hope to get on for some time without that expense. We are running but a portion of the time in either of the claims, on account of the scarcity of water, and have had none to use at Red Dog. There has been a change in the weather to-day, and has every appearance of rain, and I sincerely hope we may not again be disappointed. We exploded a blast in Neece and West claims yesterday of 394 kegs of powder, which appeared to do everything expected, but we cannot judge fairly of the effect until we test it by washing. We have exploded two other small blasts, burning in all 650 kegs, which ought, and will most likely, keep us supplied with plenty of dirt for two months to come, though we may explode other blasts before we can to advantage clean in those already exploded. Should this break in the weather give us a water supply I shall start Red Dog washing, otherwise the prospect will be slim to make much headway in this claim this season; as, if this passes without forcible rains, I shall not look for much, if any more, until March.

CEDAR CREEK.—T. B. Ludlum, Feb. 1: I last had this pleasure on Jan. 23. The weather continued clear and cold, and our ditches were empty till the morning of the 28th inst., when a drizzling rain set in, extending at times as high up as the summit. It soon started the water to running beneath the snow on the hillsides surrounding Cannon Creek, and gave us a small head which has been daily increasing, till now we have about 2800 in. under control. At this time we are washing in the Baker Star and Union, Pacific Central, and Gold Run claims, and are selling water to the Elmore Hill, Lakamp, Franklin, and Gold Run Company. The Elmore Hill and Franklin claims, each uses 1000 in. four hours per day, but in a short time will be enabled to run more constantly.—Baker Claim: On Friday, the 26th ult., we exploded the blast referred to in my last, which did good execution, crushing the gravel nearly to our incline. On Saturday, the 27th ultimo, having finished moving the partition in the sluices below, and having refitted the claim ready for a continuous run, we turned on water and commenced washing, and are now running as constantly as circumstances will permit.—Star and Union: In this claim we commenced washing on the 30th ultimo, and are removing the clay and rock slide lying in front of the face, of which I have heretofore written, with splendid success.—Pacific: We commenced washing in this claim to-day. We cannot run steadily, however, for at least a week to come, owing to the necessity of doing some dead work, which we could not do without water.—Central, or Little Pine Top: We commenced washing in this claim to-day, and intend to run day and night so long as I cannot make more profitable use of the water elsewhere.—Gold Run: We commenced washing in this claim yesterday, as the gravel is "fine sidewash," and the claim is in good working order. We expect to run day and night.

GOLD RUN.—J. A. Stone, Jan. 30: My last letter to you was Jan. 17, when it was snowing. About 5 ft. of snow fell on the summit of the mountain, but did not make sufficient water for washing. A rain storm set in yesterday, and has melted the snow far enough up to give a ditch free of water, and I expect to commence washing to-day at noon. It is not too late yet to have an average water season if plenty of snow falls in the mountains and the spring should prove cold, as it sometimes does.

ARGENTINE.—During December progress at surface and underground has been considerably retarded by the want of force and by the heavy rains, which appear now to be over. Reduction Department: Bar gold obtained in 31 days' run from 600 tons of ore, partially treated, 180 ozs. 18 dwts. 6 grs., averaging per ton 5 dwts. ¾ gr. The ore treated during the month has been principally from the North Pique and Chairman, with but a small portion from the Pique, and on an average rather poor. We started a new arrastre on the 21st inst., thus making the number up to eight.—A telegram refers to a later date than the foregoing report: "During 18 days of January 250 tons were stamped and partially treated, 150 ozs. of gold cleaned up. Great floods. Oxland's calciner has arrived at the mines. Pique pitwork working."

EXCHEQUER (Gold and Silver).—Lewis Chalmers, Jan. 29: During the week ending Saturday the 100 ft. stope was driven 12 ft.; vein 1 ft. 8 in. wide, good milling ore. The 200 stope was driven 10 ft., also in fair milling ore. The 400 face shows a vein of good ore 18 in. wide. A number of my men having left (ten of them) I raised only 34 cars of ore. My new foreman—for some time underground boss on the Virginia Consolidated Mine—says he wishes no money if he does not supply our 18 stamps to their full capacity every day in the year, provided I gave him men enough. The mill is progressing to completion, the battery finished, dry kiln will be in running order to-night, carpenters busy laying floors, but the thousand and one little things that are to be done to complete take more time in proportion than the heavy part of the work. The snow has prevented me getting up to the mine two heavy pieces of timber required to finish the hoisting works. When I get them a week ought to set them up; they are two new braces for the gallows frame. The whole of the machinery is completed. Mr. O'Hara's run will give him at least 85 per cent. of what is in the ore; I think 90 per cent. The only limit to the quantity of ore obtainable from the mine opened to the 1050 would be that fixed by the number of men you choose to put in. We have now hoisting works all but completed capable of going down to the 1000 ft. level; the lode gets larger as we go down on it, as to the quality, my own belief, firm and steadfast, is that depth will bring improvement. I shall cable the result of the O'Hara roasting when I know it myself, which will not be very long now.

I.X.L. (Gold and Silver).—Lewis Chalmers, Jan. 29: The north drift at the 200 is in 436 ft. from the cross-cut, and I am happy to say with every indication of getting into a paying body of ore at no distant day. We drove 14 ft. last week. The lode is running now in the drift, as on the top, considerably west of north, with well-defined walls, is 7 ft. wide, and dips east 50 inches. The upraise under the O.K. is up 84 ft. in very hard poorish quartz. Lode all of 10 ft. between walls. The Buckeye adit, which takes the shaft water 35 ft. from hoisting floor, is now 111 ft. north from shaft, and turned out five car loads of good ore.

PESTARENA UNITED.—Feb. 20: District of Pestarena: The lode in the bottom of the new incline shaft sinking under the 90 continues to yield 7 tons of ore per fathom, worth about 15 dwts. of gold per ton. The lode in the 90 end north is yielding 1 ton per fathom, and in the 90 end south 4 tons per fathom, worth, judging from trials of similar ore, 15 dwts. of gold per ton. The lode in the 80 end north is not looking so well, estimated to yield at present 3 tons of ore per fathom, worth 1 oz. of gold per ton. No change in the 65 cross-cut westward. No. 2 lode, in the end of the 33 north, is small at present, with stones of ore; and the lode in the end of 55 north is also yielding a little ore.—Acquavite: The lode in end of 46 south is yielding about 1 ton of ore per fathom. The lode in 33 north is yielding 1 ton per fathom, and bids fair for an improvement. In consequence of the ice in the Anza river, we suspended amalgamating on the 7th inst. In the past week we have had a more favourable time, and the water in the river has considerably increased; providing it continues, we intend resuming some of the stopes about the latter part of the present or beginning of next month, and also the amalgamation of the ore early in March.

Val Toppa: The end south of the third cross-cut in Zero level, on the western part of the great quartz lode, continues to yield 8 tons per fathom; worth 1 oz. of gold per ton. The end of intermediate level, under Zero, on this lode, is not looking so well, yielding at present 8 tons per fathom; worth about 12 dwts. per ton.—Great Quartz Lode: At the intermediate level under No. 2, south of winze, the cross-cut west has reached the footwall of the lode, which at this point is 12 ft. wide, and a mill trial of the ore taken in cutting through it gave 17 dwts. 8 grs. of sponge gold per ton. We are now driving the intermediate level southward on this lode to come forth under the stopes worked in the bottom of No. 2 level, with a view to communicate by a winze the bottom of the old stopes and the intermediate level, thereby opening up this south end of ground anew, and free from old workings. There is no change in the end south of the first cross-cut east on the Marmo Rosso lode. On the flat and new lodes the drivages north and south of stopes under No. 2 level, and south of the fourth cross-cut, yields respectively 8 tons and 6 tons of ore per fathom; worth about 10 dwts. of gold per ton. On the lode and branches east of new lode we have resumed driving an end south on a flat branch in a beautiful stratum.—No. 3 Level: No change in the end north on the new lode. We have continued to work at this district through the month the whole 20 Francfort mills.

FORTUNA.—Feb. 7: Canada Incosa: In the 120, west of O'Shea's engine-shaft, the lode is less productive than it was a short time since, but still worth ½ ton per fathom. The 110, west of Judd's, is opening a good run of ore ground, worth 1 ton per fathom. The lode in the 30, east of San Carlos shaft, is disarranged and unproductive. The 40, west of Abercrombie's, looks promising, and is worth ¼ ton per fathom. The lode in the same level east is strong and well defined, and yields ¾ ton per fathom. The 60, west of San Pedro shaft, though not so rich as it was, is still opening paying ground worth 1 ton of ore per fathom. The 70, west of this shaft, is at present of no value. In the same level east the lode is strong and regular, and contains a large quantity of quartz, with good lumps of ore, valued at 1 ton per fathom. The 120, east of O'Shea's shaft, is poor, but there is valuable ore ground in advance of it in the bottom of the 110. In the 110, east of Addis's, the men were occupied a part of the month cross-cutting towards Addis's shaft. The 90, east of this shaft, is in hard ground, and the lode is worthless. The 80, west of Kennedy's shaft, produces ¾ ton of ore per fathom. The 90 is unproductive. The lode in the 100, west of Lowndes', is large and easy for driving, and is of a promising appearance; present value ¾ ton per fathom. The same level east is also easy for driving, but does not contain any ore. The 90, east of Caro's, is now getting clear of the cross-course, and we look for an improvement; worth ½ ton per fathom. The men are cross-cutting north at the 80, east of this shaft, to get under Santo Tomas shaft. Abercrombie's shaft, sinking below the 40, will be completed to the 50 in the present month. Addis's shaft is holed to the 110. Santo Tomas shaft, below the 70, is in hard granite, and the men are getting on slowly with the work. The lode in Serrano's winze continues the same. Gerrona's winze is holed to the 40, and has laid open a valuable piece of ore ground. Leon's winze, below the 40, produces 1 ton per fathom.—Los Salidos: The lode in the 130, west of Buenos Amigo shaft, is small and unproductive. The 120, west of the same shaft, has again become valueless. There is no improvement in the 110, west of San Carlos shaft. The 130, east of Buenos Amigo shaft, is in hard granite. The 130 west of Morris's shaft, has passed the elvan course; lode small and disarranged. The lode in the same level east consists of calcareous spar, quartz, and stones of ore, of the latter ¾ ton per fathom. The ground in the 120, east of Cox's, is moderately easy for driving. A good length of valuable lode is being opened in the 110, east of San Pablo shaft, worth 3 tons of ore per fathom. The lode in the 25, east of Swaffield's, is poor. The 45, west of this shaft, continues unproductive. The 55, west of Palgrave's, is in hard granite, and the lode is of no value. The lode in the 65 has improved a little in the past fortnight, and is now worth ½ ton per fathom. In the same level east the lode is regular, and is also worth ½ ton per fathom. The 55 east has again improved, and is now opening ground worth 1 ton per fathom. The lode in Palgrave's shaft, below the 65, is split into small and unproductive branches. Quintas winze, below the 110, is poor. Victoria winze, below the 25, produces 1 ton of ore per fathom. The lode in Alfonso winze, below the 55, consists chiefly of carbonate of lime and lead ore, of the latter ½ ton per fathom. The weekly samplings were kept up very regularly in the past month, without causing any unusual fluctuation in the stopes. The ordinary surface works are going on satisfactorily, and the machinery throughout the mine is in good working order. We estimate the raisings for February at 350 tons.

ALAMILLOS.—Feb. 7: The lode in the 60, west of San Francisco shaft, is regular, and contains good stones of ore. The 50, west of San Felipe's shaft, also contains a little ore. In the 40 west the lode is large and strong. The 20, west of San Felipe's shaft, is opening ground worth 1½ ton per fathom. The 25, west of Abercrombie's, has improved, and is now a promising lode, yielding 1 ton of ore per fathom. The 40, west of this shaft, is at present of no value. The 50, east of Magdalena cross-cut, continues unproductive. The lode in the same level east is small. A favourable change has taken place in the 50, east of San Eurique's shaft, in the past few days, the lode being worth ¾ ton of ore per fathom. The 100, east of Taylor's, is hard for driving. The same level west yields 1½ ton of ore per fm., and is letting out much water. In the 85, west of San Adriano's shaft, the lode is of a promising appearance, and yields good stones of ore. The 60, east of San Victor's shaft, is very hard. In the same level west the lode is strong and regular, and produces ½ ton of ore per fathom. The 30, east of San Jose's shaft, has become much stiffer for driving. At the 50, east of Crosby's, the men are cross-cutting north to prove the ground. The north side of the 50, east of Judd's, is also being opened up to see if any part of the lode exists there. The lode in the 70, west of this shaft, is more open than it was. The 50, east of Judd's cross-cut, is without change. The lode in the same level west is small and regular, and contains good stones of ore. Abercrombie's shaft, below the 40, will reach the 50 in the present month. Placido's winze, in consequence of an influx of water, is temporarily suspended. In Horno's winze, below the 50, the lode is larger than it was. Depozo's winze, also sinking below the 50, contains good stones of ore, but not enough to value. The lode in Torrente's winze, below the 45, is regular and well defined. Breton's winze, below the 25, is situated east of Addis's shaft. The weekly samplings of ore were kept up very regularly in the past month, and the stopes are without any change to notice. The works at surface are going on uninterruptedly, and the machinery is in excellent condition. We estimate the raisings for February at 175 tons.

ALMADA AND TIRITO CONSOLIDATED SILVER MINING COMPANY (LIMITED).

DIOS PADRE AND MINA GRANDE.

DIOS PADRE.—Capt. W. Clemo, Dec. 7: In the tunnel end there is no change worthy of notice, except the ground being a little harder, the last week's drift being 4 ft. 6 in. There now remains to drive 108 ft. 8 in. to shaft. The water has gone down in the shaft 2 ft. 2 in. in the past week. There now remain 63 ft. 10 in. of water in the shaft.

Dec. 14: The ground in the tunnel end is much harder than it was, leaving out a little water; the last week's drift was 3 ft. 2 in. There now remains to reach the shaft 105 ft. 6 in. In the past week the water has gone down in the shaft 1 ft. 8 in. There now remains 62 ft. 2 in. of water in the shaft.

Dec. 21: The tunnel end has again changed into quartz, and is leaving out more water—so I think we must be getting near the west branch of the lode. The ground is still very hard, and slow to drive. The last week's drift was 4 ft. 6 in. There now remains to reach the shaft 101 feet. In the past week the water has gone down in the shaft 1 ft. 10 in. There now remains 61 ft. 4 in. of water in the shaft.

Dec. 28: Dios Padre: The tunnel end continues hard, and slow to drive; no change to notice. The last week's drift was 4 ft. 9 in. There now remains to reach the shaft 96 ft. 3 in. In the past week the water has gone down in the shaft 1 ft. 9 in. There now remains 59 ft. 7 in. of water in the shaft.

Jan. 4: The tunnel end continues the same as last week. The last week's drift was 4 ft. 6 in.; there now remains to reach the shaft 91 ft. 9 in. In the past week the water has gone down in the shaft 1 ft. 6 in., and there now remain 58 ft. 1 in. of water in the shaft.

Jan. 11: The tunnel end has no great change to notice. The last week's drift was 4 ft. 3 in., and there now remains to reach the shaft 87 ft. 6 in. In the past week the water has gone down in the shaft 11 in., and there now remains 57 ft. 2 in. of water in the shaft.

Frank W. Breach, Dec. 15: In the Dios Padre we are still in the horse between the east and west branches; the ground is harder than previously, and the progress slower. The water in the shaft is draining steadily.

Dec. 28: The tunnel end in Dios Padre is still in hard ground, the western branch of the lode not yet being reached. In the shaft the water has now drained to the back of the 250 ft. level; as soon as this is drained I think we may try the whim, haul the remaining water, and commence to sink.

Jan. 11: In the Dios Padre shaft the water is down 3 ft. below the back of the 250 ft. level. In the tunnel end the ground is fair for driving, and the men are making good progress. In two or three weeks we may expect to pass the west wall of the lode, and make still more rapid driving.

MINA GRANDE.—Frank W. Breach, Dec. 28: In the Balvanera shaft we have put down the pumps to the 22, so that if required we can go to work on the black ore over the 12, and drive the 22 at any time.

TIRITO AND NEW EAST LODE.

Capt. W. Clemo, Dec. 7: Tirito Engine-shaft: In the 23 we have now began to drive north from stope on a branch of ore that runs from the footwall into the slide; this branch is about 4 ft. wide; the slide at this point being so disordered I think there is a chance of its widening as it goes north. In the winze in the 32 we have now began an underhand stope from the south end of the winze, commencing about 3 fms. from the bottom; the productive part of the lode is about 3 ft. 6 in. wide. The engine-shaft sinking below the 42 is still very favourable, with very little water in the bottom; the ground sunk last week was 3 ft. 6 in.—New East Lode: The workings around the slide at the tunnel level have no change since last week. We are now getting in the stull and shoots to secure the walls, work the backs, and fill the cars to better advantage; this will diminish the output for a few days.

Dec. 14: Tirito: We have now began to take out the arch in back of the 10, and have communicated to the tunnel level in one end of the stope. We are obliged to work with very great care so as not to bury the ore as the old stull comes down on us. The engine-shaft in the 23 has no great change since last week. The 32 stope from south end of winze is turning out a fair quantity of ore; the orey part of the lode still remains about 3 ft. 6 in. wide. The engine-shaft sinking below the 42 has no change since last week; the ground sunk last week was 4 ft. We are now 14 ft. below the 42.—New East Lode: The workings around the slide at tunnel level we have now finished the stull at this place, and are again working the back. The lode continues to turn out a fair quantity of ore. We shall begin to sink the winze in the south end of this place again to-day.

Dec. 21: Tirito: In the 10 we are still taking out the arch in the back of this level, and so far with great success. We have taken out 20 ft. of the arch up to the bottom of the level without damaging the old stull, or losing any of the ore. The engine-shaft in the 23 is not looking so well as it did; it is more disordered as it gets into the slide. In the 32 the lode in the south end of the winze appears to be slightly improving as we get into it, and is dipping a little to the south, which looks well for the lode at a deeper level. The engine shaft sinking below the 42 is now idle for a few days, as we have to timber the sides of the shaft, which are rather too weak to sink under. On account of the lode coming nearer the shaft the ground is rather disordered. We are fixing a cistern for the pump in the shaft at the 42. The cistern once in place we shall continue to sink without the pump, as the water apparently comes from the 42, there being very little below. I think we shall be sinking again by the middle of next week. The ground sunk last week was 3 ft. 3 in; we are now 17 ft. 3 in. below the 42.

NEW EAST LODE.—The workings around the slide at the tunnel level are rather improved since last week. The winze in the south end of this place is also improving; the lode is firmer; the hanging-wall is dipping more to the west, while the footwall keeps its regular pitch; the lode is 3 ft. 6 in. wide, and very solid.

Dec. 28: Tirito 10 fm. level: The taking out of the arch in this back still goes on favourably. A part of the old level has fallen in, but has done no damage to our workings, neither have we lost any ore in the stuff that fell.—Engine-Shaft, 23 fm. level: At this place there is nothing being done at present. The lode in the south end of the winze in the 32 continues to improve; it is getting wider, and still dips to the south, while the ore is of better quality.—Engine-shaft sinking below the 42: We have finished the timbering at the shaft, and placed the pump in the cistern. We are now sinking again, and all going on well. I think we shall be able to sink faster without the pump in the bottom of the shaft.—New East Lode: In the workings around shaft at tunnel level there is no change to notice since last week.

Jan. 24: Tirito 10 fm. level: The taking out of the arch in this back still goes on successfully. The lode in the south end of winze in the 32 has no change since last week. We have now begun to drive north from the bottom of this winze; here we have a very fair lode about 2 ft. wide, and rising to the north, showing that the dip is south—towards the shaft. Engine-shaft sinking below the 42: There is no change, there is very little water in the bottom; ground sunk last week was 4 ft. We are now 21 ft. 3 in. below the 42.—New East Lode: In the workings around slide at tunnel there is no change to notice.

Jan. 11: Tirito 10 fm. level: The taking out of the arch in this back still goes on without change or accident.—The 32 fm. level: The lode in the south end of the winze is not looking as well as it was. We appear to be driving near the foot of the ore, as we have more ore in the bottom of this end than in the back. The southerly dip of the lode accounts for this. The end driving north from this winze is steadily improving. We have now about 40 ft. in length of orey ground open at the bottom of this winze.—Engine Shaft sinking below the 42 fm. level: We have now cut the lode in the bottom of the shaft, showing some very fair ore of both green and black ore, while the general appearance of the lode is very favourable, considering we are only a few feet below and south of where it is in the slide. The ground sunk last week was 4 feet. We are now 25 ft. 3 in. below the 42 fm. level.—New East Lode—Workings Around Slide at Tunnel: The ore in this place continues to turn out a fair quantity of ore. The winze sinking below the tunnel at this place is not looking quite so well as regards quality, but the lode is getting much wider.

Frank W. Breach, Dec. 15: The engine-shaft in the Tirito is still in the most favourable ground for sinking. This week the cistern at the 42 will be in place, and we shall at once raise the drawing lift, and pump from the cistern only. By this means the shaft may be sunk dry and more rapidly, as by conducting the water in the 42 to the cistern its running into the shaft will be avoided, and as the ground in the shaft yields no water, I see no obstacle to its being sunk without the pumps—at any rate, until the lode crosses the shaft. In the 32 winze we are still driving south, and at the same time stoping the ore, which continues a width of from 3 to 3½ ft. of metal, of rather below average ley, but with pitanque pretty well distributed through it. The new east lode, south of the slide, still continues to yield a fair supply of ore, of a good ley. As far as we can judge, this lode continues to some point between the 20 and 32, and there unites with the main lode, on which we drove those levels. At all points from over the tunnel to 23 fathoms below we have proved that it forms a part of the body of the north slide, while at the same time it continues further south, and cuts off the slide on the east. Altogether it is a very curious formation, and although, as I have stated, it undoubtedly goes down to below the 23, it appears to get into disconnected balls of ore as it goes down—probably a little over the 10. Below the tunnel we are down 15 ft. in the winze, and the ore is still solid, but only 2 ft. wide. In the 10 it is in balls from the 23, and, were it not for the pitanque it contains, the ground would not require to break. Taking it as a whole, it is a good help at the present time, and that is all that can be said for it now, although, in future, the fact of this lode passing through the slide, and completely destroying it, may lead to discoveries of value to the mine. We are now breaking the ore in the back of the 10, north of the slide, impelled to do so under the tunnel, and to which we have holed, the tramway now going through the new east lode, and leaving us free to let in the stull over this part of the mine.

Dec. 28: The pump now works from the cistern at the 42, and we are still keeping the shaft dry, at least in a miner's acceptation of the term, as we only have about 200 gallons of water in 12 hours. The progress making is very good. In the winze the ore improves as we drive south. We have now 3 ft. in the end. In the new east lode the ore holds well in the stopes over the tunnel level; above it is 9 ft. wide by 60 ft. long. It is also solid in the winze sinking in the 10, and 2 ft. wide. The ore in the 10 back is being taken down without accident or loss of ore, and the old tunnel level has now run together gradually, and without sudden crush.

Jan. 11: Tirito Shaft: The lode is now crossing the shaft. We have stone of green and black ore, but the body of the lode is not yet cut in sinking. What we have seen is very promising, especially as it is a little to the south of the new slide, where it dies out. In the 32 winze we have 40 ft. in length of very fair ore, and are driving north and south. The works in the south new east lode turn out fairly, and are worked very cheaply, the attle running into and filling the ends as we rise on the end of our own works. The 10 fm. back to tunnel level is being taken out very well, and without accident of any kind.

AMERICAN HANDBOOK OF FINANCE.

There are probably few things of which people know less, although many pretend to considerable knowledge on the subject, than the history and nature of money and finance, yet the perusal of Mr. Fawcett's "Gold and Debt"* will satisfy everyone that the study is by no means an uninteresting one. The author's object was to compile in a compact form trustworthy statements and figures regarding the great factors in the financial problems of the day, and to which reference is continually made in financial discussions—the increase and decrease of the volume of paper money at various periods in the United States and in Europe during the last 30 years; the production of gold and silver, and the consumption of these metals in the arts since the beginning of the gold era in 1849, the addition to the world's stock of gold and silver used as money, and the amounts now in all countries. That the whole of Mr. Fawcett's statements are accurate is not to be pretended, but since they are very interesting anything coming in this respect is amply compensated. It not unfrequently happens that a writer determines upon his conclusion, and then frames the premises to suit, and Mr. Fawcett's philological dissertation upon the derivation of the word "dollar" involves an argument of this kind. He mentions that when Count Schlick first coined, in 1518, at Joachimsthal, in Bohemia, his silver pieces were of the uniform weight of 1 oz. These coins soon became—from the traders of the time being in want of some international standard fixed, at least, by common consent, as a measure of the value of other coins—in good repute over Europe under the names of Schlickenthaler or Joachimsthaler, which were subsequently contracted into thaler.

This view is to some extent confirmed by the fact that in Germany the thaler is still designated by the symbol "Rthr." for Reichsthaler, showing that the description of the source or quality of the thaler was not unusual. The German word thaler, because dahler (pronounced almost dawler) in low German, and so on, it is beyond question that it was direct from the Low German that the English word dollar was derived, and the attempt to trace it to the Gaelic *dol*, a valley, and on, a hill, is equivalent to declaring that the Troy of the Greek poets was so called in honour of a city of the same name in the United States. It appears, adopting Mr. Fawcett's chronology, that only one year after Schlick commenced the coinage of Joachimsthaler, Charles V. of Spain, became Emperor of Germany, adopted as his coat of Imperial arms, in which those of Spain were quartered with those of the empire, and as they bore the pillars Jachin and Boaz, which some people think have a connection with the Temple of Solomon, although Mr. Fawcett regards them as the pillars of Hercules, the new coin became known as the "pillar dollar," and was adopted as the trading standard. These dollars were found by Sir Isaac Newton, when assayer to the British Mint, to be of the exact value of 5*s*. Thus this standard dollar that was used in calculating nearly all international exchanges with the United States, whence the ratio 4*s* 44·44 to £. From January, 1874, the Anglo-American exchanges have been calculated by the London Stock Exchange at $5 in £, which is very close to the American standard; it also closely corresponds with the Paris standard of 5 frs. to $1, and to that of Amsterdam, which fixes it at 2½ guilders to $1. The slight variations, however, and the different mode of quoting American securities on the markets of London, Frankfort, Amsterdam, Paris, and elsewhere cause an apparent discrepancy in prices which are really equivalent.

The quantity of paper money and coin circulating in the United States is treated of in detail, and it appears that in June, 1876, there was $102,000,000 of coin and $735,358,832 of bank notes and unfunded Government debt in circulation. There is a good historical sketch of paper money and bank notes, and of the suspension of specie payments in various countries. With regard to the European circulation, Mr. Fawcett finds that the gold, silver, and base metal coin, and gold and silver bullion in circulation and in banks in all Europe was of gold, $1,872,000,000, and silver and base metal, $2,060,000,000, which with about $2,300,000,000, raised the grand total to $6,200,000,000. Chevalier estimated the total of gold, in its various forms of coin, bullion, and personal ornaments, in the world in 1850 at about $2,830,000,000; and in 1876 Mr. Seyd estimated the total stock of gold in circulation in the current year at the enormous figure of $3,750,000,000. Mr. Fawcett considers some of the estimates open to criticism, but shows that at the commencement of the era of gold—1849—the total stock of gold and silver in the world was about $10,000,000,000, of which $6,300,000,000 was silver, and $2,700,000,000 gold. The total product of gold in the world for 35 years ending 1874 was $3,391,000,000.

With regard to the consumption of gold in the arts, and loss by wear, casualties, &c., he says that undoubtedly the largest consumption is in the manufacture of jewellery and personal ornaments, and though the jewellery is not consumed it is pretty well understood that very little ever comes into the market as old gold. The consumption in this way reaches an aggregate of $125,000,000 per annum. He estimates that in the 35 years mentioned (there was an excess of consumption over production in the five years ending 1874 of $9,000,000) the consumption was $2,168,000,000, showing a net addition to the stock of gold coin in the 35 years of about $1,223,000,000, and he shows that from 1850 to the present time this addition has been constantly less in each period of five years.

The book altogether appears to have received very careful attention, and many original views have been introduced. His estimate of the amount of gold and silver in use in the several countries of the world, to judge from the details given as to the manner in which his results have been obtained, is probably more reliable than any yet published, and for the same reason full confidence may be placed in his statement that the consumption of gold in the arts and by loss and wear is greater than the annual production, and that, consequently, the world's stock of gold is diminishing. Mr. Fawcett has certainly much to justify him in attributing the rise of prices in the era of gold, from 1849 to about 1862, to the depreciation of gold, and a still greater rise in the era of debt from 1862 to the present time, to four great wars of which the chief was the American civil war; but it is difficult to follow him so far as to assume that the present financial depression, which is generally considered to result from the nefarious practices of promoters of public companies and negociators of loans, coupled with the dishonest recklessness of speculative capitalists, is due to the increasing demand for a metallic circulating medium to make exchanges, pay interest on debts, and redeem paper money; these demands Mr. Fawcett says have increased the value of the precious metals, and caused the decline in the value of commodities. The volume should be read by all who take an interest in financial matters.

* "Gold and Debt; an American Handbook of Finance, with a Digest of the Monetary Laws of the United States." By W. L. FAWCETT. Chicago: Griggs. London: Trübner and Co., Ludgate Hill.

FOREIGN MINING AND METALLURGY.

The Western of France Railway Company has profited from the comparatively low rates now current, and has given out orders for 150,000 tons of steel rails. These orders have been shared as follows:—Creusot, 35,000 tons, to be delivered between 1878 and 1881; Terrenoire, 30,000 tons, to be delivered between 1877 and 1880; and Chemond, 30,000 tons, to be delivered between 1878 and 1880, Fourchambault, 25,000 tons, to be delivered between 1878 and 1880. The price of these contracts is in three cases 8*l.* 17s. 6d. per ton, delivered free at Paris; in the remaining case it is 9*l.* 2s. 6d. per ton. These rates are sensibly lower than the 9*l.* 7s. 6d. per ton at which the Paris, Lyons, and Mediterranean Railway Company recently let a great contract for 215,000 tons of steel rails. As regards the general situation of the French iron trade, there is little or nothing to report; prices are the same as they were a week since, and the aspect of affairs has not experienced any material change; at any rate, no noticeable improvement has been established.

The contract for steel wire for the great suspension bridge between Brooklyn and New York has, after much deliberation, been given to the firm of J. Roebling, Sons, and Co, Taunton, New Jersey. The wire called for by the specification was "No. 8, full Birmingham gauge. A length of 14 feet must weigh exactly 1 lb." Each wire was required to have a breaking strength of no less than 340 lbs., corresponding, in wire weighing 14 feet to the lb. to a rate of 160,000 lb. per square inch of solid section. The specification called for 3400 tons of steel wire, or 6,800,000 lbs. There were a few foreign competitors present at the opening of the bids for this large contract; among others a representative of Johnston and Nephew, Manchester, who offered to supply the steel at 13½ cents per lb., and another from W. T. Henley and Co., London, whose price was 6¾d. sterling, delivered in Brooklyn, or 30*l.* sterling per ton free on board at London. The samples presented by both these houses were very highly praised, and we apprehend it was the operation of the tariff alone that prevented the London firm from getting the contract. The original intention of using Bessemer steel was given up, and crucible steel adopted.

The administration of the Belgian State Railways has been negociating with two important metallurgical establishments for the purpose of entrusting to them the construction of ten carriages on the Belpaire system. It is stated that some capitalists intend to purchase from the Acoz Company its Châtelineau rolling mill, for the purpose of establishing Bessemer steel works. This announcement has excited some surprise, having regard to the present condition of the steel trade, as well as of the iron trade, and in presence also of the enormous quantity of steel which existing steel works can now produce. Even when a revival in business sets in, the present steel works of England, Belgium, France, and Germany could readily meet the steel requirements of the whole of Europe. It is hoped that the spring will bring with it some activity, especially as regards building industry. Experiments which have been made with rails upon the Cologne and Minden Railway show that while iron rails have worn up to the extent of 76¾ per cent., Bessemer steel rails have only worn up to the extent of 3¼ per cent. In the current number of the "Revue Universelle des Mines" M. Greiner contributes a paper on the meaning of the words "iron" and "steel," in regard to which no very definite ideas are current among metallurgists.

The tone of the French coal trade continues very indifferent; prices are to a great extent nominal, and little reliance can be placed upon published quotations. The coal trade of the Pas-de-Calais is depressed; the extraction is for the present in excess of the demand. In the basin of the Loire business has been somewhat better maintained; but, although the deliveries show some increase, the aspect of affairs is far from brilliant. A terrible explosion of fire-damp has taken place in the Sainte Barbe pit, at the Graissessac Mines; out of 60 men in the pit only five were saved. It is expected that Austria will take part in the great French Universal Exhibition of 1878, and public opinion—at one time rather undecided upon the subject—is now favourable to this great *fete* of peace, which will, probably, have the effect of disseminating some interesting information as to the progress which French coal mining has made during the last ten years.

Chilian copper has fallen 4s. to 8s. per ton at Paris, according to the source of supply. The German copper markets have ruled quiet. At Paris tin has fallen about 2*l.* per ton. The Rotterdam tin market has, however, shown a little more firmness, in consequence of the result of a recent sale of Billiton tin at Java. Holders of Banca tin at Rotterdam have refused to sell Banca below 43¾ fls., and Billiton below 42¾ fls. Lead has been supported at previous rates at Paris. The Berlin lead market has also ruled firm. At Paris rough zinc has fallen 8s. to 10s. per ton. The German zinc markets have been inactive.

The Belgian coal trade has remained in a languishing condition, and there appears unfortunately to be little prospect of any immediate improvement. It seems now probable that there will be scarcely any winter in 1877; at any rate it must be a short one, and this circumstance tells adversely, of course, upon the demand for coal in Belgium. The average fall in coal at Brussels since December, 1876, has been about 1s. 8d. per ton. M. de Bal has been elected president of the United Coal Trade Associations of the Centre Charleroi, Liége and Mons, for 1877. A general meeting of the associations is to be held at Brussels in March, in order to examine jointly the present situation.

THE "UPPER TEN THOUSAND."—We remarked last year that there had hitherto been considerable difficulty in determining where the line enclosing the "upper ten thousand" was to be drawn, and from the third annual edition just issued (The "Upper Ten Thousand, for 1877; a Handbook of the Titled and Official Classes." London: Kelly and Co.) it appears that Messrs. Kelly entertained something of the same doubt, for they have this year enclosed another 800, so that the ten thousand must either have been very small before or very large now. The addition, however, is undoubtedly important, and renders the book very complete, as in its present form not only does it contain the names of all titled people, however low they may have sunk in the social scale through hereditary misfortune, but also the names of all the deputy-lieutenants and justices of the peace of England and Wales, the greater part of whom have never before appeared in any book of this class, perhaps from their being comparatively unknown except to their immediate friends and neighbours. The perusal of the volume will prove interesting in many respects; for example, there is a very complete general table of precedence which gives some curious particulars, the offices of Lord Great Chamberland and Earl Marshall gives the holder only a qualified precedence—he merely moves above those of his own rank. Again, Knights of the Garter appear to have no rank as such, though a distinct position is given to Knights of the Bath, Star of India, and St. Michael and St. George, as well as Knights Bachelor. Even some academical degrees are recognised, and in a most peculiar manner, thus, after the younger sons of Knights' Bachelor come Doctors of Divinity, Law, and Medicine respectively, but Masters of Arts have no defined position, or, if any, it is below that of the Bachelors of Divinity, Law, and Medicine, for it is below these that clergymen, who are the principal holders of the superior Arts degree are placed, barristers coming below clergymen. Now, as clergymen and barristers may be considered to have completed their studies whilst Bachelors are still students, the correctness of this arrangement is very questionably. Similarly, Durham should be placed before London University, and probably Melbourne before Sydney. The work will interest a large number of readers, and will prove exceedingly useful in ascertaining the correct titles, addresses, and position of anyone belonging to the class treated of, and it will form a very handsome volume for the table, as it is beautifully printed and handsomely bound; it contains nearly one-third more pages—663 against 513—than last year's edition, yet owing to the machinery used in pressing the paper the book occupies slightly less space than its predecessor, although it weighs 1 lb. 14 ozs., as compared with 1 lb. 11 ozs. The Upper Ten Thousand will certainly remain in favour for many annual editions.

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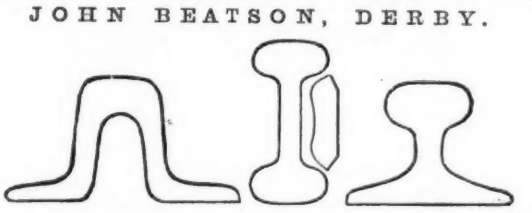

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"The book cannot fail to be well received by all connected with collieries."—*Mining Journal.*
"Its contents are really valuable to the miners of this country."—*Miners Conference.*
"Such a work, well understood by miners, would do more to prevent collier accidents than an army of inspectors."—*Colliery Guardian.*
London: MINING JOURNAL Office, 26, Fleet-street; and to be had of all book sellers.

THE NEWCASTLE DAILY CHRONICLE
(ESTABLISHED 1764.)
THE DAILY CHRONICLE AND NORTHERN COUNTIES ADVERTISER
Offices, Westgate-road, Newcastle-upon-Tyne; 50, Howard stree North
Shields: 195 High-street, Sunderland.

THE "CRANSTON" ROCK DRILL
SUITABLE FOR
QUARRYING, SINKING SHAFTS, SUBMARINE BLASTING, TUNNELLING, DRIVING ADITS,
Is the MOST SIMPLE and ECONOMICAL DRILL now in use.
BOILERS; AIR COMPRESSORS, worked by Hydraulic or Steam-power; STEEL for MINING DRILLS; PUMPING, and all other MINING MACHINERY supplied.
For Prices, Estimates, and other Particulars, apply to—
J. G. CRANSTON, 22, GREY STREET,
NEWCASTLE-ON-TYNE.
Mr. TAIT, Manager, East Hetton Quarry Company's Works, Coxhoe, Durham, writing on May 12, 1876, says—"I have pleasure in testifying to the value of your Rock Drills. The two you supplied us with about six months ago are giving us entire satisfaction. The cost of drilling by machine is less THAN ONE-FOURTH THAT OF DRILLING BY HAND. By the use of the Drills we have been able very greatly to increase the out-put of stone without increasing the number of men employed."

Teams Patent Hemp and Wire Rope Works,
GATESHEAD-ON-TYNE.
DIXON, CORBITT, AND SPENCER,
MANUFACTURERS of every description of ROUND and FLAT ROPES of any length for COLLIERY, RAILWAY, AGRICULTURAL, SHIPPING, and other purposes, and guaranteed of the highest standard of strength.
Best Selected Charcoal Iron, Best Crucible Cast Steel, and extra strong Improved Steel Round and Flat Wire Ropes; Compound-laid non-rotating Flexible Ropes, in Iron or Steel for small gear and sinking purposes; Best Selected Charcoal Iron Guide Ropes; Galvanised and Plain Ropes for capstans, crabs, suspension bridges, canal towing, &c.; Patent Steel Plough Ropes; Galvanised Signal and Fencing Strands; Copper Rope Lightning Conductors; Steel, Iron, and Copper Sash Cords; Picture Cords; Russian, Italian, and Manilla Hemp Round and Flat Ropes; White and Tarred Hemp and Flax Spun Yarns; Round and Flat Rope Pulleys and Patent Springs for same; Galvanised Wire Rope for Ships' Standing Rigging; Russian, Italian, Manilla, and Coir Cordage; Towlines, Warps, Service and other Lines for Shipping Purposes; Ships' Rigging fitted by experienced workmen.
D., C., and S. beg to call special attention to the advantages to be derived by adopting their EXTRA STRONG IMPROVED STEEL ROPES, for lifting heavy loads in deep mines, also in hauling from long distances; a considerable reduction is effected in weight, friction materially reduced, and an extra amount of work got out of the rope—a rope 8 lbs. per fathom being equal in strength to an iron rope 20 lbs. per fathom, or an ordinary steel rope 12 lbs. per fathom.

JEWELS, PLATE, AND VALUABLES
May be DEPOSITED for SAFE CUSTODY in the Fire and Burglar-proof Vaults of the
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LONDON INTERNATIONAL EXHIBITION, 1874.

CORNWALL POLYTECHNIC SOCIETY, 1867 and 1873.

TANGYE BROTHERS AND HOLMAN,

10, LAURENCE POUNTNEY LANE, LONDON, E.C.,

AND BIRMINGHAM, (TANGYE BROTHERS), CORNWALL WORKS, SOHO.

The "SPECIAL" DIRECT-ACTING STEAM PUMP,

WITH

Holman's Patent Self-acting Exhaust Steam Condensers.

UPWARDS OF 12,000 "SPECIAL" STEAM PUMPS ARE IN USE.

After eight years of successful application for all purposes to which steam-driven pumps can be applied, THE "SPECIAL" STEAM PUMP STILL MAINTAINS THE FIRST POSITION IN THE MARKET, notwithstanding that it alone—of all direct-acting pumps—has been subjected to the great variety of severe tests that must be encountered in such a period of time. Some valuable improvements have been suggested in the course of a long experience, and their adoption has rendered the apparatus at once the simplest and most certain in action. There is absolutely no extraneous gear, and the steam cylinder is *no longer than the pump*. The valves are of easy access, and are suited for pumping fluids and semi-fluids of almost any consistency.

Holman's Condenser

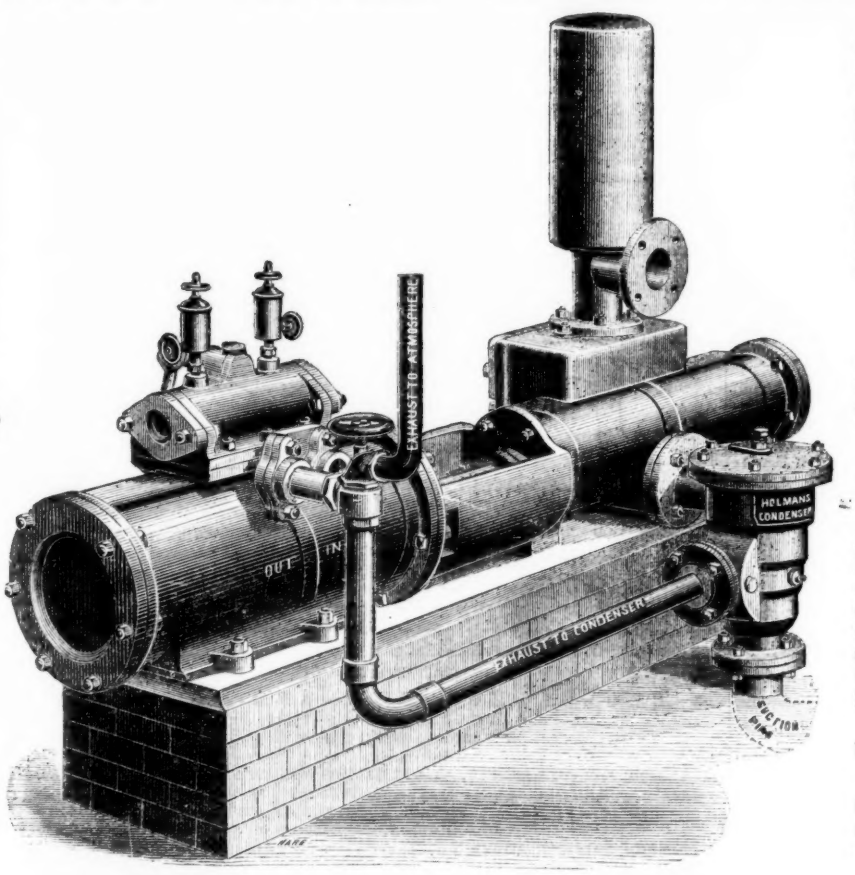
TURNS WASTE STEAM INTO GREAT POWER.

SAVES HALF ITS COST IN PIPES AND CONNECTIONS.

PREVENTS ALL ESCAPE OF STEAM IN MINES OR ELSEWHERE.

REQUIRES NO EXTRA SPACE.

SAVES TWENTY TO FIFTY PER CENT. OF FUEL.



WILLIAM ELLIOT, Esq., *of the Weardale Iron and Coal Company, writes under date Sept.* 17th, 1875, *as follows:*—"We have now THIRTY-FIVE of your SPECIAL STEAM PUMPS in operation at the various collieries under my charge—some of them employed pumping water out of our pits to the depth of 50 fms.—others employed in the pits, and a good many feeding Boilers. I have no hesitation in saying that we have found them the Cheapest and Best Pumps of the kind we have tried. I can with confidence recommend them to intending purchasers."

Messrs. BURT, BOULTON, and HAYWOOD, *Chemical Manufacturers, of London*, have FORTY of the "SPECIAL" STEAM PUMPS in use at their works.

HOLMAN'S CONDENSERS

Are made to suit any size and kind of Steam Pump. They form a part of the suction pipe of the Pump, and while they effectually condense the exhaust steam they produce an average vacuum of 10 lbs. per square inch on the steam piston, increasing the duty of the Engine, and effecting a saving in fuel of from 20 to 50 per cent.

In Mining operations these Condensers will be of great value.

All Boiler Feeders are recommended to be fitted with these Condensers, as not only is the exhaust steam utilised in heating the feed water, but is returned with it into the boiler.

GREAT REDUCTION IN PRICES.

The following sizes are suitable for low and medium lifts:—

Diameter of Steam Cylinder ...In.	3	4	4	4	5	5	5	6	6	6	6	7	7	7	7	7	8	8	8	8	8	9	9	9	9	9	10	10
Diameter of Water Cylinder ...In.	1½	2	3	4	3	4	5	3	4	5	6	3	4	5	6	7	4	5	6	7	8	5	6	7	8	9	5	6
Length of Stroke .....In.	9	9	9	9	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	18	12	12	12	18	24	12	12
Gallons per hour	680	815	1830	3250	1830	3250	5070	1830	3250	5070	7330	1830	3250	5070	7330	9750	3250	5070	7330	9750	13,000	5070	7330	9750	13,000	16,500	5070	7330
Price of Special Pump ...£	**16**	**18**	**20**	**25**	**22 10**	**27 10**	**32 10**	**25**	**30**	**35**	**40**	**30**	**35**	**40**	**45**	**50**	**40**	**45**	**50**	**55**	**65**	**50**	**55**	**60**	**70**	**85**	**55**	**60**
Extra, if fitted with Holman's Condenser and Blow-through Valve	£7	£7	£9	£11	£8 10	£11 10s	£12 10s	£9	£12	£15	£15	£10	£13	£15	£16	£22	£13	£16	£16	£22	£22	£16	£16	£23	£24	£35	£17	£17

CONTINUED.

Diameter of Steam Cylinder..In.	10	10	10	10	12	12	12	12	12	12	14	14	14	14	14	14	16	16	16	16	16	18	18	18	18	18	18	18
Diameter of Water Cylinder..In	7	8	9	10	6	7	8	9	10	12	7	8	9	10	12	14	8	9	10	12	14	9	10	12	14	16	10	12
Length of Stroke .....In	12	18	24	24	18	18	18	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24
Gallons per hour	9750	13,000	16,519	20,000	7330	9750	13,000	16,519	20,000	30,000	9750	13,000	16,519	20,000	30,000	40,000	13,000	16,519	20,000	30,000	40,000	16,519	20,000	30,000	40,000	50,000	30,000	40,000
Price of Special Pump..£	**65**	**75**	**90**	**100**	**75**	**80**	**85**	**110**	**120**	**140**	**110**	**120**	**130**	**140**	**150**	**180**	**140**	**150**	**160**	**180**	**200**	**180**	**190**	**210**	**230**			
Extra, if fitted with Holman's Condenser and Blow-through Valve	£23	£24	£35	£35	£20	£27	£27	£38	£38	£50	£28	£28	£40	£40	£55	£55	£28	£40	£40	£55	£55	£45	£45	£56	£60			

Intending purchasers of Steam Pumps would do well to observe the great length of stroke, short steam cylinder, and short piston of the "Special" Steam Pump, as compared with the short stroke, long steam cylinder, and long piston of the Pumps of other makers, as the efficiency and durability of the machine, and the space occupied by same, greatly depend upon this. The advantage of long strokes will be obvious when purchasers are reminded that each set of suction and delivery valves of a "Special" Steam Pump with 24 in. stroke, running at 120 ft. per minute, would open and close only 30 times per minute, as against 120 times per minute in a Pump with only 6 in. stroke performing same duty.

The "Special" Steam Pump can be worked by Compressed Air as well as by Steam.

HUNDREDS of these PUMPS are USED for HIGH LIFTS IN MINES, for which purpose they are made with 21, 24, 26, 28, 30, and 32-inch Steam Cylinders, and 36 48 and 72-inch Strokes.

The following Testimonial gives one Example of the Power Gained by the action of Holman's Patent Condensers:—

NORLEY COLLIERY, WIGAN.

Messrs. TANGYE BROTHERS AND HOLMAN.

GENTLEMEN,—I have great pleasure in recording my entire satisfaction with the working of the Holman's Patent Steam Pump Condenser which you have supplied to us. The complete condensation of the steam is, apart from its value in the strict economical sense, a most valuable feature in the drainage of underground workings. The perfect manner in which this important result is accomplished by your Condenser is extremely creditable to you, and merits the thanks and commendation of the Mining Engineer. When we start the "Special" Steam Pump the Condenser commences working automatically, and maintains a constant vacuum of 10¾ lbs. per square inch, even when we run the Pump upwards of 80 strokes (106 feet) per minute. It may perhaps be interesting to you to know that when we were running the Pump at 84 strokes (168 feet) per minute, the steam gauge indicating a steam pressure of 36 lbs. per square inch, 80 yards from the Pump, and the Condenser vacuum gauge on the exhaust pipe indicating a steady vacuum of 21½ inches, I turned the exhaust steam from the Condenser into the atmosphere, when the speed at once fell to 44 strokes per minute. The working economy thus shown is really so great that the cost of the Condenser must be saved in a very short time. (Signed) J. THOMPSON.

NORTH OF ENGLAND HOUSE ... ... TANGYE BROTHERS AND RAKE, ST. NICHOLAS BUILDINGS, NEWCASTLE-ON-TYNE.
SOUTH WALES HOUSE... ... ... TANGYE BROTHERS AND STEEL. Tredegar Place. NEWPORT. Mon.; and Oxford Buildings, SWANSEA.

BLAKE'S PATENT STEAM PUMP.

MORE THAN 10,000 IN USE.

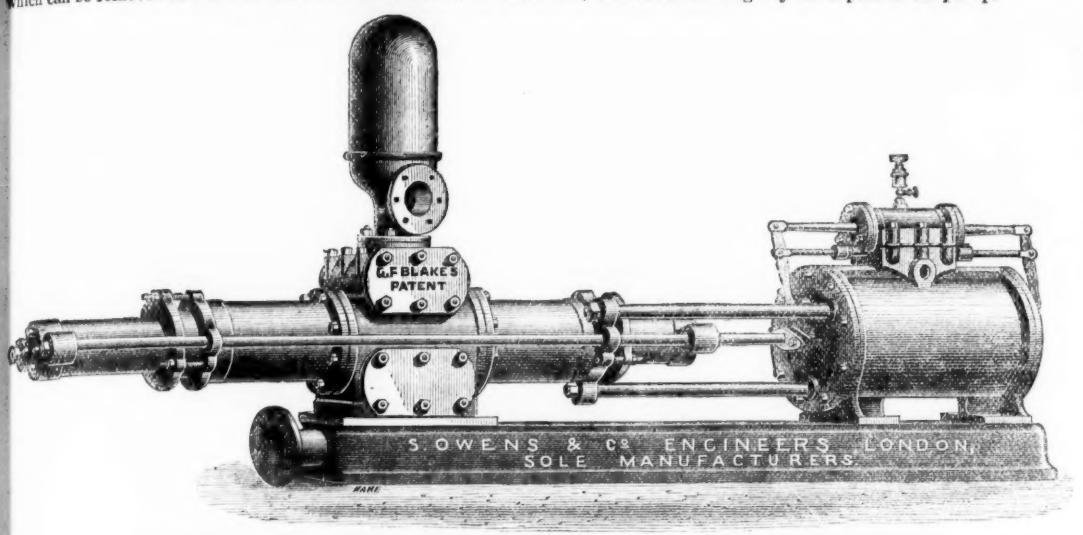
SOLE MAKERS FOR GREAT BRITAIN,

S. OWENS & CO.,

Hydraulic and General Engineers, Whitefriars-street, London;

And at 195, Buchanan-street, Glasgow (W. HUME, AGENT).

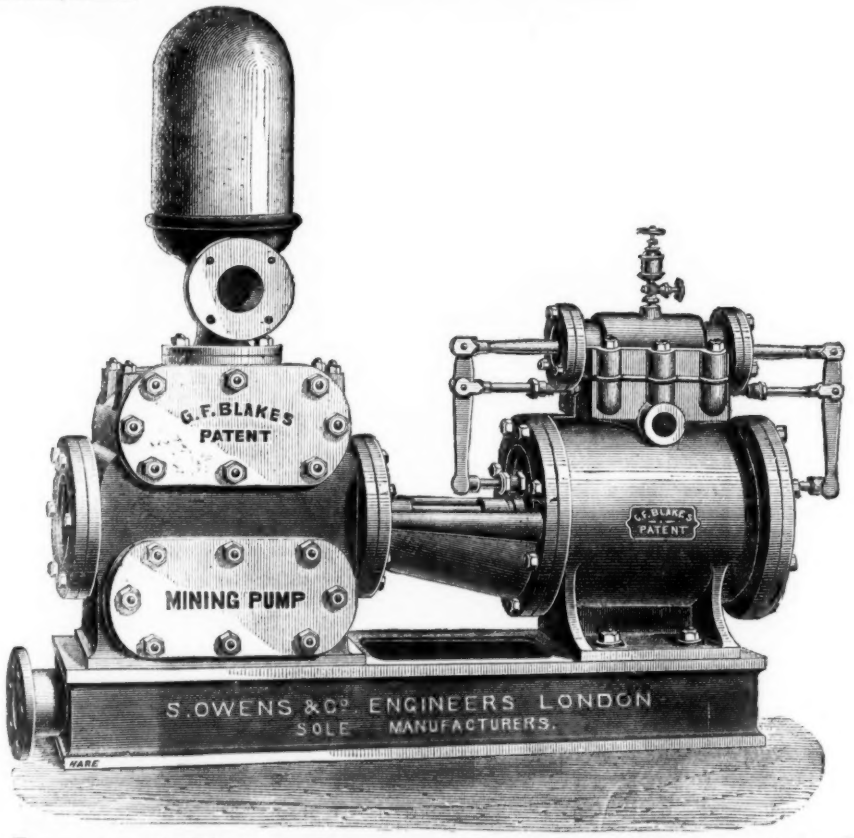
These PUMPS from their SIMPLICITY, RELIABILITY, DURABILITY, and ECONOMY are SPECIALLY SUITED FOR MINING PURPOSES, where large quantities of water require to be raised from great or medium depths with CERTAINTY. They are double-action in their construction, throwing a constant stream of water, can be made of any stroke to suit the space in which they have to work, can be arranged with any combination of steam and water cylinders to suit the pressure and lift against which it is desired to work them, are made of the very best materials and highest class of workmanship, and all working parts can be readily got at by any ordinary workman, and replaced if necessary by a duplicate part (all such being interchangeable) in the shortest possible time. For situations where gritty and sandy water has to be pumped the DOUBLE-PLUNGER PATTERN is recommended. Where space is limited the PISTON PUMP is better suited, a novel feature of which is the PATENT REMOVEABLE LINING, which can be removed in a few minutes and substituted with a new one, without disturbing any other part of the pump.



Blake's Improved Double-plunger Steam Pump.

S. OWENS AND CO.,

In placing the BLAKE STEAM PUMP before the mining world, believe they are offering the BEST, MOST RELIABLE, and ECONOMICAL PUMP that has yet been made, and solicit an inspection of various sizes in operation at their works, Whitefriars-street, Fleet-street, London.



Blake's Improved Mining Pump, with Patent Removeable Lining to Pump Cylinder,

Any combination of these Pumps may be had to suit circumstances. The following are some of the SIZES SUITABLE FOR MINING PURPOSES:—

Dia. of steam cylinders.. In.	12	12	12	12	14	14	14	16	16	16	16	18	18	18	18	20	20	20	20	24	24
Dia. of water cylinders.. In.	3	4	5	6	4	5	6	4	5	6	8	4	5	6	8	5	7	8	9	6	8
Length of stroke ... ... In.	18	18	18	24	24	24	24	24	24	24	24	24	30	30	30	30	30	36	36	36	42
No. of strokes per minute..	30	30	30	30	25	25	25	22	22	22	22	22	22	22	22	20	20	17	17	17	15
Quantity in gallons per hour, approxmately ...	1440	2610	4200	5940	2940	4620	6600	2646	4158	5940	10620	2646	5160	7500	13260	4586	9000	12360	15660	6720	12000

PRICES FOR THE ABOVE, OR ANY SPECIAL SIZE, AND ILLUSTRATED CATALOGUES FURNISHED ON APPLICATION

PATENT CONDENSERS

Can be supplied for any size pump to effect a saving of fully 30 per cent. in the consumption of fuel, greatly increasing their efficiency

The Blake Pump will work under water, and as efficiently with compressed air as with steam.

BLAKE'S DONKEY PUMPS FOR FEEDING BOILERS KEPT IN STOCK.

PATENT

"INGERSOLL ROCK DRILL,"

LE GROS AND CO.

60, Queen Victoria Street, London, E.C.

5, PARK PLACE, NEW YORK, U.S.A.

We claim 40 per cent. greater effective drilling power, and offer to compete with any machine of its class.

See following extracts from the reports of Judges in awarding Medals:—

"2. Its simple construction ensures durability, &c.

"4.—The steam or air cushions at each end of cylinder effectually protect from injury.

"5. Its having an automatic feed, giving it a steady motion, &c.

"6. Its greater steadiness and absence of jar and vibration experienced in other drills, which is very destructive to their working parts, &c.

"7. Its greater power is some FORTY PER CENT. in favour of the Ingersoll."

Medals awarded for several years in succession "For the reason that we adjudge it so important in its use and complete in its construction as to supplant every article previously used for accomplishing the same purpose."

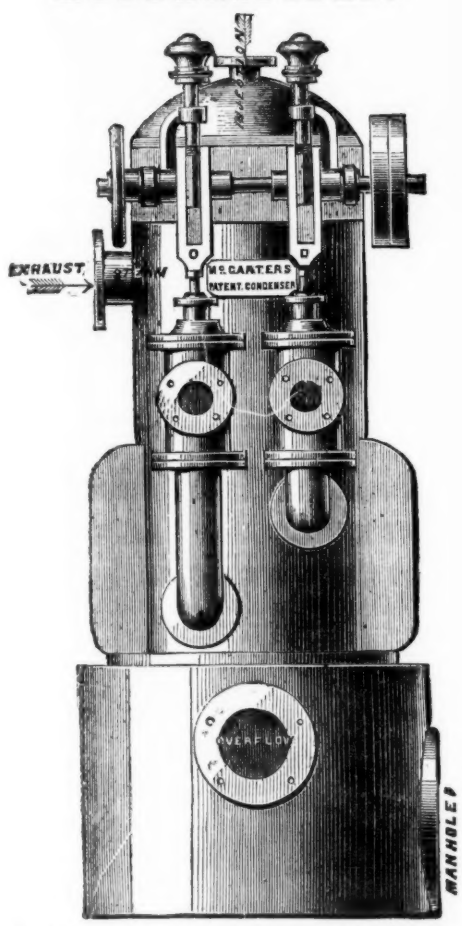
Estimates given for Air Compressors and all kinds of Mining Machinery. Send for Illustrated Catalogues. Price Lists, Testimonials, &c., as above.

LICENSED MAKERS.

KIRK, RAMSDEN, AND CO.

(LIMITED)

HUDDERSFIELD.



These Condensers can be placed inside or outside of the engine-house. They draw their own injection water, and require no foundation. Specially adapted to Pumping and Winding Engines, effecting a saving from 20 to 30 per cent. in coal, and increases the power of the Engine.

Engineers, Millwrights, Founders,

AND

FORGE PROPRIETORS.

Makers of Pumping, Winding, and Blowing Engines, Condensing and Non-condensing. Horizontal and Beam Engines for all purposes.

IN THE SPRING Parr's Life Pills are used by Thousands.—They clear from the system all hurtful impurities, promote appetite, aid digestion, purify the blood, and keep the bowels regular. PERSONS SUFFERING from HEADACHE, Liver Complaints, Pains in the Shoulders and the Back, Gout, Rheumatism, and General Debility are particularly recommended to try

PARR'S LIFE PILLS

They have never been known to fail in affording immediate relief.

BLAKE'S NEW PATENT STONE BREAKER.

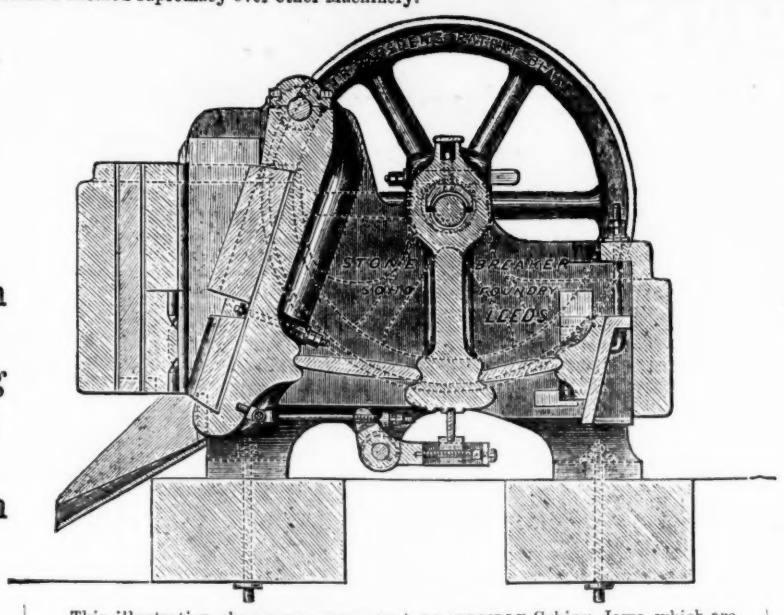
H. R. MARSDEN,

ORIGINAL PATENTEE, AND **ONLY** MAKER IN THE UNITED KINGDOM.—**1250** IN USE.

These Machines are in extensive use amongst the Tin, Copper, Lead, and other Mines, and are showing a clear saving of 4d. and 6d. per ton over the ordinary mode of hand spalling, besides a diminution of stamping power equal to 30 per cent., which is a considerable saving. They are already well known to the mining world, and can be seen in operation at some of the leading Cornish and other Mines. For breaking the elvan rock they have established a decided supremacy over other Machinery.

Exclusively adopted by Her Majesty's Government, and by most Continental Governments.

Machines for Hand and Steam Power, specially designed and largely used for Crushing Pyrites, Limestone, Cement, Coal, Rocks, Canister, &c., at all the principal works in the Kingdom.



Used by all the Great Mining Companies in the World, and are shown by Testimonials to effect a Saving of FIFTY per cent over every other system.

Awarded 60 Gold and Silver Medals:—

Paris, 1867.
Santiago, 1869.
Leeds, 1875.
Leicester, 1868.
Cardiff, 1872.
Bolton, 1872.
Ayr, 1873-4-5-6, &c.

EXTRACTS FROM TESTIMONIALS.

"They occupy an important position as labour-saving Machines."—*Architect.*

"The Machine is well designed, simple, but substantially made, and is capable of reducing any material to fine gravel, such as copper ore, and is certainly preferable to the stamps in use for that purpose."—*Mining Journal.*

"Your Machine will crush from 60 to 120 tons of hard limestone per day of 10 hours."

This illustration shows my new patent REVERSIBLE Cubing Jaws, which are made in upper and lower sections, and the backs planed, so that when the bottom part of the lower section becomes worn it can be turned upside down, and thus made equal to new. This process does not require the aid of skilled labour, the white metal being entirely dispensed with.

THESE JAWS WILL WEAR FOUR TIMES longer than any other, and they can be renewed at a fractional cost.

"No Machine is equal to yours, combining as it does very great power, simplicity of construction, and cheapness."

"Mr. Marsden's Stone Breakers are so thoroughly well known and appreciated that it is unnecessary for us to describe their construction or speak of their merits.—*Engineering.*

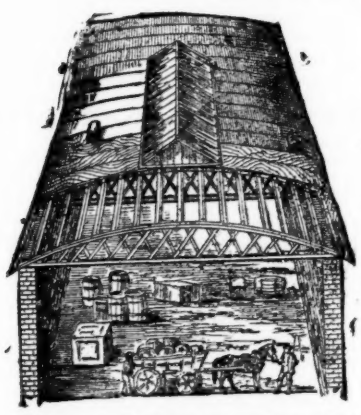
"By the use of your Machine we have reduced the cost of breaking and forming road material to one-half its previous cost."

"Our 15 by 7 Machine has broken 4 tons of hard whinstone in 20 minutes for fine road metal, free from dust."

CATALOGUES, TESTIMONIALS, &c. (in the French or German language, if required), on application to the sole maker of "Blake's" Stone Breaker:—

H. R. MARSDEN, SOHO FOUNDRY, LEEDS, ENGLAND.

M'TEAR AND CO.'S CIRCULAR FELT ROOFING,



FOR
GREAT ECONOMY
AND
CLEAR WIDE SPACE.

For particulars, estimates and plans, address,—

M'TEAR & CO.,
ST. BENET CHAMBERS,
FENCHURCH STREET,
LONDON, E.C.;
4, PORTLAND STREET,
MANCHESTER;
OR
CORPORATION STREET,
BELFAST.

The above drawing shows the construction of this cheap and handsome roof, now much used for covering factories, stores, sheds farm buildings, &c., the principal of which are double bow and string girders of best pine timber, sheeted with ¾ in. boards, supported on the girders by purlins running longitudinally, the whole being covered with patent waterproof roofing felt. These roofs so combine lightness with strength that they can be constructed up to 100 ft. span without centre supports, thus not only affording a clear wide space, but effecting a great saving both in the cost of roof and uprights.

They can be made with or without top-lights, ventilators, &c. Felt roofs of any description executed in accordance with plans. Prices for plain roofs from 30s. to 60s. per square, according to span, size, and situation.

Manufacturers of PATENT FELTED SHEATHING, for covering ships' bottoms under copper or zinc.

DRY HAIR FELT, for deadening sound and for covering steam pipes, thereby saving 25 per cent. in fuel by preventing the radiation of heat.

PATENT ASPHALTE ROOFING FELT, price 1d. per square foot.

Wholesale buyers and exporters allowed liberal discounts.

PATENT ROOFING VARNISH, in boxes from 3 gallons to any quantity required 8d. per gallon.

HEPBURN'S
PUMP LEATHER
WATERPROOF

By a special method of preparation, this leather is made solid, perfectly close in texture, and impermeable to water; it has, therefore, all the qualifications essential for pump buckets, and is the most durable material of which they can be made. It may be had of all dealers in leather, and of—

I. AND T. HEPBURN AND SONS,
TANNERS AND CURRIERS, LEATHER MILLBAND AND HOSE PIPE MANUFACTURERS,
LONG LANE, SOUTHWARK, LONDON
Prize Medals, 1851, 1855, 1862, for
MILL BANDS, HOSE, AND LEATHER FOR MACHINERY PURPOSES.

THE GREAT ADVERTISING MEDIUM FOR WALES.

THE SOUTH WALES EVENING TELEGRAM
(DAILY), and
SOUTH WALES GAZETTE
(WEEKLY), established 1857,
the largest and most widely circulated papers in Monmouthshire and South Wales
CHIEF OFFICES—NEWPORT, MON.; and at CARDIFF.

The "Evening Telegram" is published daily, the first edition at Three P.M., the second edition at Five P.M. On Friday, the "Telegram" is combined with the South Wales Weekly Gazette," and advertisements ordered for not less than six consecutive insertions will be inserted at an uniform charge in both papers.

P. O. O. and cheques payable to *Henry* Russell Evans, 14, Commercial-street *Newport*, Monmouthshire.

MINING PROSPECTUSES AND ANNOUNCEMENTS OF PUBLIC COMPANIES should be inserted in the BARNSTAPLE TIMES, published every Tuesday, and in the DEVON POST, published every Saturday, as these papers circulate largely throughout Devon and Cornwall, where many thousands of investors reside. Legal and Public Companies' advertisements, 6d. a line each insertion; Trade and Auctions, 4d. a line; Wanteds, &c., 20 words, 1s.

Published by J. B. JONES, Boutport-street, Barnstaple, Devon, to whom all orders by post or telegraph should be sent.

BRYDON AND DAVIDSON'S ROCK DRILL.

SELECTED BY THE BRITISH AND OTHER GOVERNMENTS.

Reduced prices of this Rock Drill (formerly called "Kainotomon"), Nos. 1 and 2, £32 and £34.

SUBJECT TO DISCOUNT.

IMPROVED AIR COMPRESSORS.

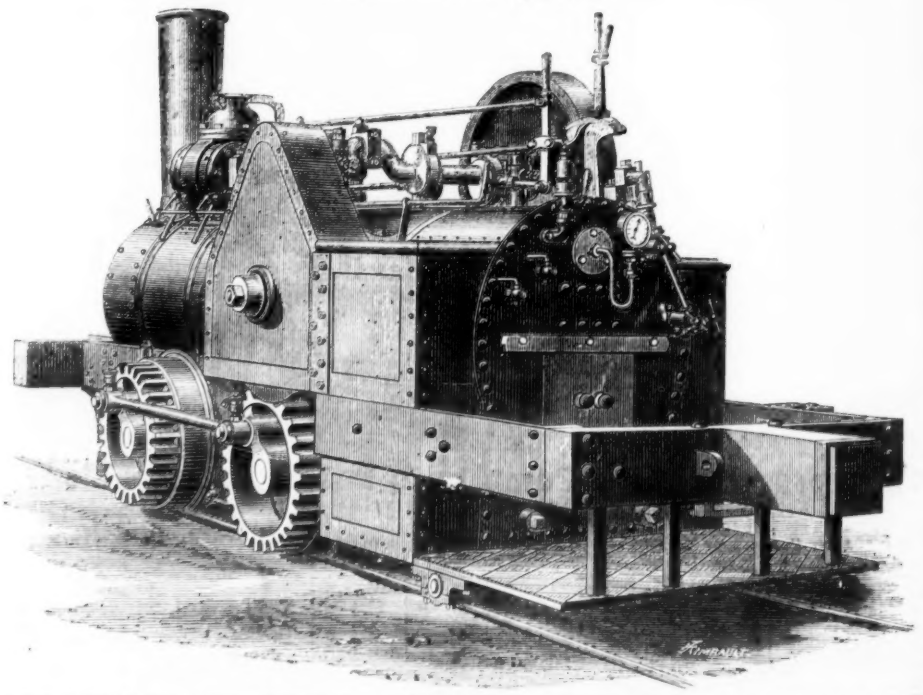
Makers of Pumping and Winding Engines, Steam Hammers, Boilers, Pump Pipes, &c., &c. Castings of all kinds.

BRYDON AND DAVIDSON, ENGINEERS,
WHITEHAVEN.

LEWIN, POOLE, DORSET.

Speciality in cheap colliery and contractors' Locomotives, and very small Locomotives for replacing Horses.

Prices from £300 upwards.



PORTABLE FIXED AND VERTICAL ENGINES.

WINDING AND PUMPING GEAR.

The above represents LEWIN'S STEEL-GEARED LOCOMOTIVE, from a photo of one working on a 22 in. gauge, for replacing horses.

STREET AND ROAD TRAMWAY LOCOMOTIVES,

ON THE MOST IMPROVED PRINCIPLE.

Printed by RICHARD MIDDLETON, and published by HENRY ENGLISH (the proprietors) at their offices, 26, FLEET STREET, E.C., where all communications are requested to be addressed.—*February 24, 1877.*